WESTON® MANAGERS DESIGNERS/CONSULTANTS
Roy F. Weston, Inc.
4th Floor
67 Batterymarch Street
Boston, Massachusetts 02110-3206
617-204-2700 • Fax 617-204-2701

July 11, 1997
Work Order No. 10971-002-055-0007

Ms. Daria Till
Site Assessment Contracts Manager
U.S. EPA Region I
JFK Federal Building (MC HBS)
Boston, MA 02203-2211

Subject: Final Site Inspection Prioritization Report
New England Aircraft Plant #1
Farmington, Connecticut
CERCLIS No. CTD059831479
TDD No. 9502-10-CWX
Delivery Order No. 0002

Dear Ms. Till:

Enclosed is one copy of the Final Site Inspection Prioritization (SIP) Report for the New England Aircraft Plant #1 property in Farmington, Connecticut. Two copies of the Final SIP Report have been sent to the Connecticut Department of Environmental Protection (CT DEP) in Hartford, Connecticut under separate cover. Comments received from the U.S. Environmental Protection Agency Region I and CT DEP regarding the contents of the Draft SIP Report have been incorporated. Attachments have been omitted from this final deliverable as no comments or changes to the attachments were requested during the review process. The Final SIP Report was prepared in response to U.S. Army Corps of Engineers Delivery Order No. 0002.

Please call me or Mr. Robert Merkl at (617) 204-2700 if you have any questions regarding this report.

Very truly yours,

ROY F. WESTON, INC.

Taso Goujiamanis
Task Manager

TG:gs
Enclosures
cc: R. Merkl (WESTON ADO Manager)

REMEDIAL SITE ASSESSMENT DECISION - EPA NEW ENGLAND

Site Name: New England Aircraft Plant #1 **EPA ID#:** CTD059831479

Alias Site Names:

Address: 36 Spring Lane **City:** Farmington **State:** CT

Refer to Report Dated: 07-11--97 **Report type:** SIP

Report developed by: RFW /CoE

DECISION:

| | **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

| X| **2. Further Assessment Needed Under CERCLA:** 2a. (optional) Priority: |X | Higher | | Lower

2b. Activity Type: | | PA | | ESI | | SI | | HRS evaluation

| X] Other: Further evaluation needed

DISCUSSION/RATIONALE:

There is a potential release to the surface water and potential contamination of surface water targets.

There has been a release to groundwater and contamination of groundwater targets.

Report Reviewed and Approved by:

Don Smith Signature: Don Smith Date: July 11, 1997

Site Decision Made by:

Don Smith Signature: Don Smith Date: July 11, 1997

EPA Form # 9100-3

FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
NEW ENGLAND AIRCRAFT PLANT #1
FARMINGTON, CONNECTICUT

CERCLIS No. CTD059831479
TDD No. 9502-10-CWX
Delivery Order No. 0002

Prepared by:

Roy F. Weston, Inc.
67 Batterymarch Street
Boston, Massachusetts 02110

July 11, 1997

ROY F. WESTON, INC.

Reviewed and Approved:

Task Manager — Date: 7/11/97

Delivery Order Manager (or designee) — Date: 7/11/97

QA Review — Date: 11 Jul 97

Work Order No. 10971-002-055-0007

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the U.S. Army Corps of Engineers New England Division and Roy F. Weston, Inc. (WESTON®). Professional services performed and reports generated by WESTON have been prepared for EPA Region I purposes as described in the contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. WESTON therefore expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

TABLE OF CONTENTS
(Concluded)

Title		Page
ATTACHMENT D -	NEW ENGLAND AIRCRAFT PLANT #1 FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS UNIONVILLE AND PLAINVILLE WATER COMPANIES Samples collected January 21, 1994 and January 26, 1995 . . .	D-1
ATTACHMENT E -	NEW ENGLAND AIRCRAFT PLANT #1 GROUNDWATER, SEDIMENT, AND SURFACE WATER SAMPLE ANALYTICAL RESULTS ROY F. WESTON, INC. Samples collected July 12, 1995	E-1

LIST OF FIGURES

Figure No.	Title	Page
1A	Location Map	2
1B	Area Map	3
2	Site Sketch	5
3	Groundwater Sample Location Map	33
4	Surface Water Migration Route	40
5	Surface Water and Sediment Sample Location Map	48

LIST OF TABLES

Table No.	Title	Page
1	Source Evaluation for New England Aircraft Plant #1	10
2	Hazardous Waste Quantity for New England Aircraft Plant #1	11
3	Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park	13
4	Source Sample Summary: New England Aircraft Plant #1, Samples Collected by NUS/FIT on July 10, 1989	19
5	Summary of Analytical Results, Source Sample Analysis for New England Aircraft Plant #1: Samples Collected by NUS/FIT on July 10, 1989	20
6	Public Groundwater Supply Sources within Four Radial Miles of New England Aircraft Plant #1	26
7	Estimated Drinking Water Populations Served by Groundwater Sources within Four Radial Miles of New England Aircraft Plant #1	27
8	Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park	28

LIST OF TABLES
(Concluded)

Table No.	Title	Page
9	Groundwater Monitoring Well Locations at New England Aircraft Plant #1, Installed by HRP Associates, Inc. in 1992 and 1993	29
10	Groundwater and Drinking Water Sample Summary: New England Aircraft Plant #1, Samples Collected by WESTON on July 12, 1995	32
11	Summary of Analytical Results, Drinking Water Sample Analysis for New England Aircraft Plant #1: Samples Collected by WESTON on July 12, 1995	34
12	Water Bodies Along the 15-Mile Downstream Pathway from New England Aircraft Plant #1	41
13	Sensitive Environments Located Along the 15-Mile Downstream Pathway from New England Aircraft Plant #1	42
14	Sediment Sample Summary: New England Aircraft Plant #1, Samples Collected by NUS/FIT on July 10, 1989	42
15	Summary of Analytical Results, Sediment Sample Analysis for New England Aircraft Plant #1: Samples Collected by NUS/FIT on July 10, 1989	43
16	Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995	45
17	Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995	50
18	Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995	52
19	Estimated Population within Four Radial Miles of New England Aircraft Plant #1	55
20	Sensitive Environments within Four Radial Miles of New England Aircraft Plant #1	55

Final Site Inspection Prioritization Report
New England Aircraft Plant #1
Farmington, Connecticut

CERCLIS No. CTD059831479
TDD No. 9502-10-CWX
Delivery Order No. 0002
Work Order No. 10971-002-055-0007

INTRODUCTION

Roy F. Weston, Inc. (WESTON®) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the New England Aircraft Plant #1 (NEAP) property at 36 Spring Lane in Farmington, Connecticut. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by the EPA Region I. A Screening Site Inspection (SSI) Report for the NEAP property was prepared by the NUS Corporation Field Investigation Team (NUS/FIT) on July 6, 1990. NUS/FIT documented that wastes generated at the NEAP property included 1,1,1-trichloroethane (1,1,1-TCA), chloroethane, petroleum naphtha, cutting oil, and wastewater treatment sludge. In addition, NUS/FIT documented the past disposal of metal hydroxide sludge to a parking lot on the NEAP property. On the basis of the information provided in the SSI Report, the NEAP SIP was initiated.

EPA Region I has also requested WESTON to perform SIP investigations on 15 facilities, including NEAP, which are located within and adjacent to the Farmington Industrial Park (FIP) in Farmington and Plainville, Connecticut. For the purposes of this report, these 15 facilities will be referred to as the FIP area.

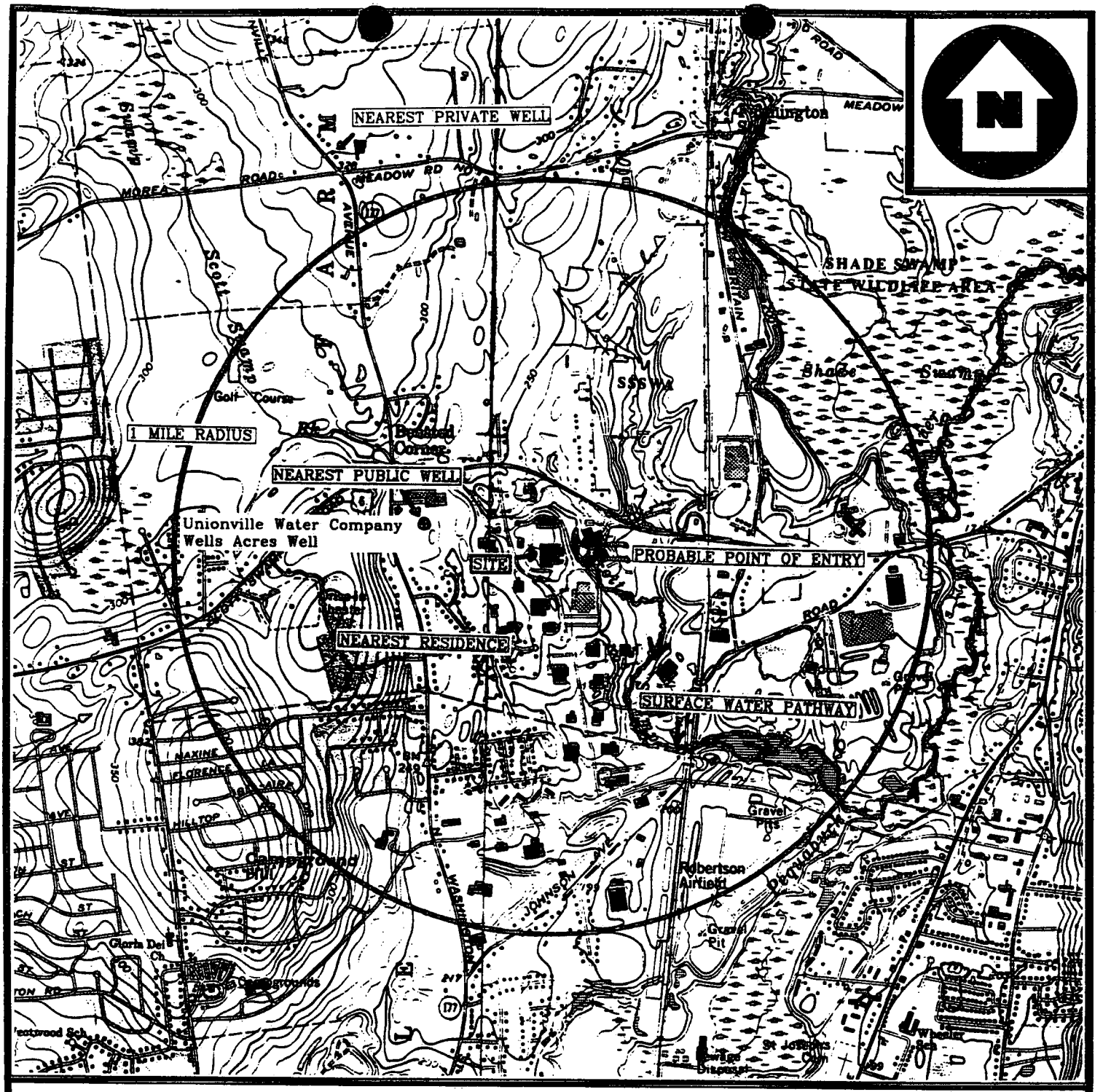
Background information used in the generation of this report was obtained through file searches conducted at EPA Region I and the Connecticut Department of Environmental Protection (CT DEP), telephone interviews with town officials, conversations with persons knowledgeable of the NEAP property and conversations with other Federal, State, and local agencies. Additional information was gathered during the WESTON on-site reconnaissance on June 29, 1995 and WESTON environmental sampling on July 12, 1995.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. These documents do not necessarily fulfill the requirements of other EPA regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

The NEAP property is located at 36 Spring Lane in Farmington, Hartford County, Connecticut at geographic coordinates 41° 42′ 10.2″ north latitude and 72° 52′ 19.5″ west longitude (Figure 1A and 1B) [1; 2]. According to the Farmington Town Assessor, the NEAP property is

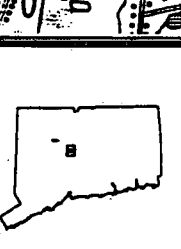
Note: Text which appears in italics indicates that original portions of the SSI Report were either copied or paraphrased.



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' U.S.G.S. QUADRANGLE(S):
NEW BRITAIN, CT, 1966, PHOTOREVISED 1992; BRISTOL, CT, 1966, PHOTOREVISED 1984

1 · 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET



QUADRANGLE LOCATION: NEW BRITAIN, CONNECTICUT

LOCATION MAP

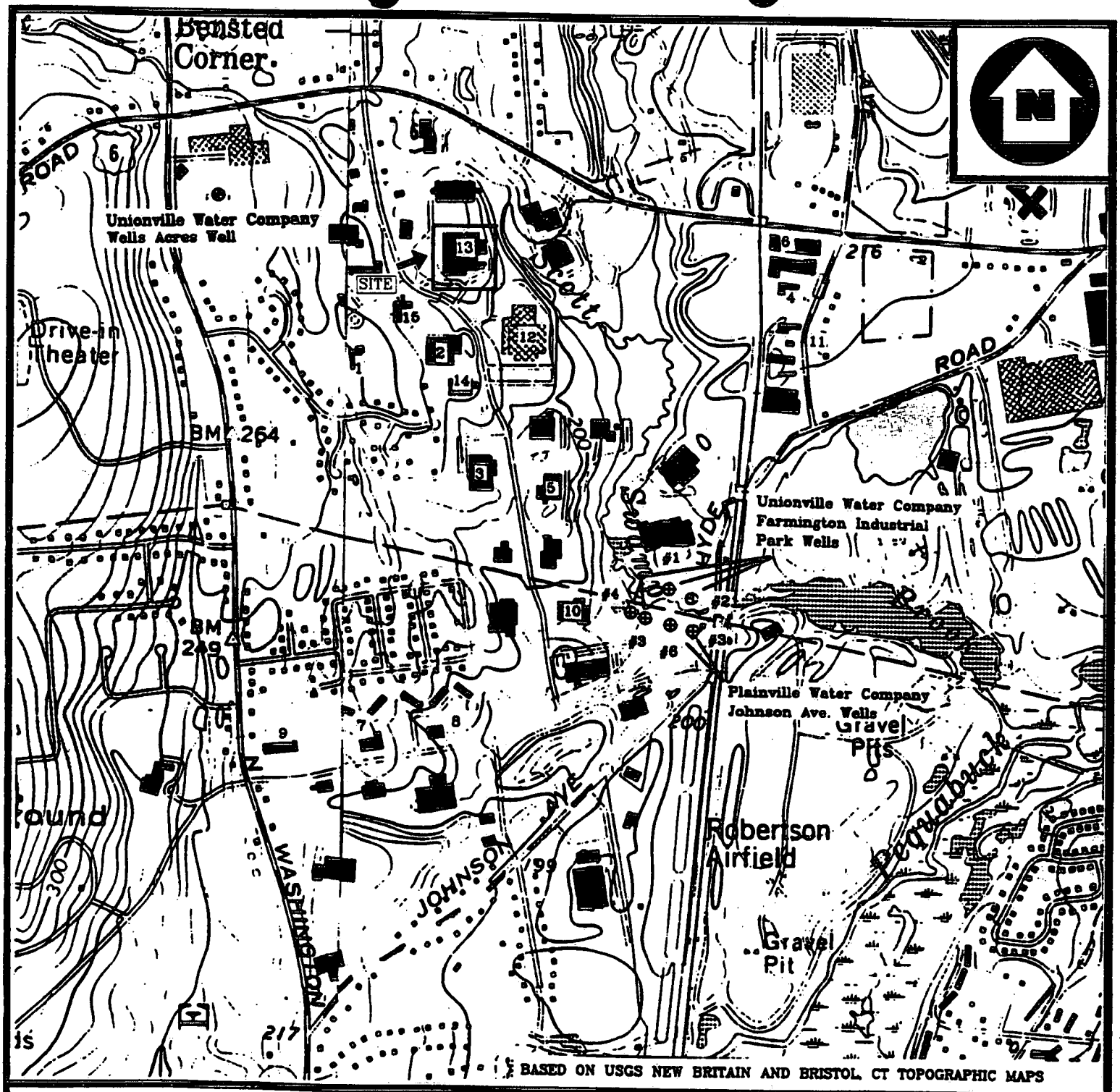
NEW ENGLAND AIRCRAFT PLANT #1

FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1A

J:\PROJECTS\10971002\055\FIG1A.DWG



LEGEND

1 – Dell Manufacturing Co.
2 – Edmunds Manufaturing Co.
3 – Fletcher-Terry Company
4 – Gros-ite Ind., Inc.
5 – Kip, Inc.
6 – Whitnon-Spindle
7 – American Tool and Manufacturing
8 – Brown Manufaturing
9 – ESCO Laboratories
10 – Mott Metallurgical Co.
11 – Roy Machinery and Sales
12 – Connecticut Spring & Stamping
13 – New England Aircraft Plant No. 1
14 – New England Aircraft Plant No. 2
15 – Mallory Industries

AREA MAP

FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON

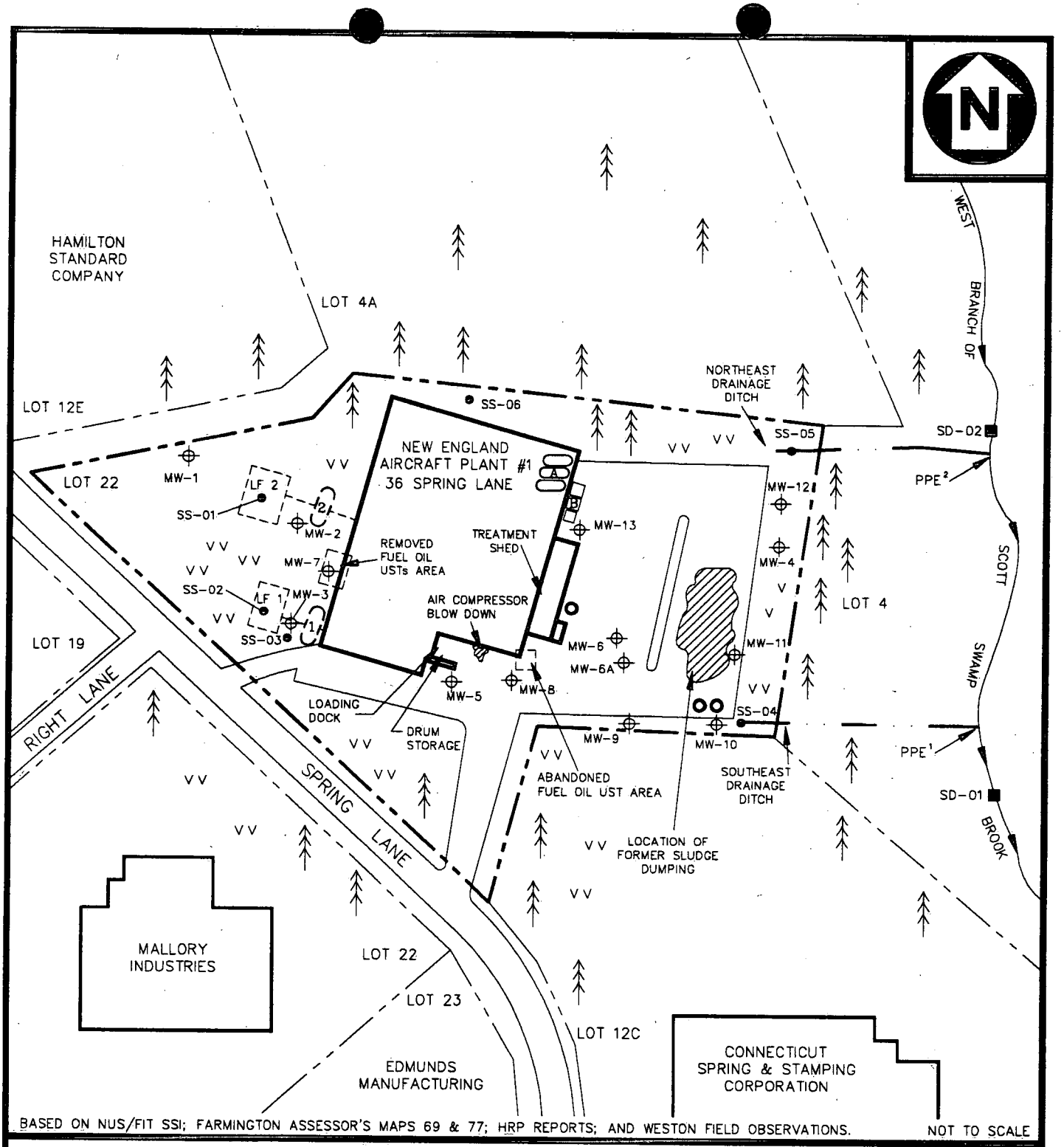
FIGURE 1B

depicted on Map Nos. 69 and 77, as Lot No. 12B (Figure 2) [4; 6]. The property was leased by New England Aircraft Plant #1 from 1961 to 1976 and is currently owned and operated by Inco Engineered Products, Inc. (IEP) of Ivoryton, Connecticut [57]. The property houses an active manufacturing plant currently producing jet aircraft engine blades and vanes [3]. The NEAP property is approximately eight acres and is occupied by a single story 84,000-square foot (sq ft) manufacturing building [6]. The surrounding area is zoned for industrial and residential use. The NEAP property is abutted to the north by the Hamilton Standard Company, to the east by the West Branch of Scott Swamp Brook, to the south by the Connecticut Spring and Stamping Corporation (CERCLIS No. CTD001143007), and to the west by Spring Lane. Edmunds Manufacturing Company (CERCLIS No. CTD054187455) and Mallory Industries, Inc. (CERCLIS No. CTD001148568) are located south and southwest of the property on Lots 23 and 22, respectively (Figure 2) [1; 3; 4].

Based on observations made by WESTON during the June 29, 1995 on-site reconnaissance, a paved parking area is located east of the manufacturing building, and a smaller paved parking area is located south of the manufacturing building [3; 55]. There is an active loading dock located at the southeast corner of the manufacturing building [55]. The NEAP property can be accessed from the south by two driveways located along Spring Lane. There are no fences or gates surrounding the property which restrict vehicular or pedestrian access. The north and east perimeters of the property are wooded, and the remainder of the NEAP property is covered by a maintained lawn (Figure 2) [3; 55].

The NEAP property slopes gradually from the west to the east [3; 4; 55]. Overland flow from the NEAP property generally travels east and is collected at one of two drainage ditches on-site. One drainage ditch is located at the southeast corner of the eastern parking lot and the other is located at the northeast corner of the property (Figure 2) [3; 4; 55]. Both ditches lead sharply down to the West Branch of Scott Swamp Brook [3; 4]. The probable point of entries (PPEs) of overland flow to surface water are the points at which the drainage ditches discharge into the West Branch of Scott Swamp Brook. No stained soils or stressed vegetation were observed during the WESTON on-site reconnaissance [3; 55]. HRP Associates, Inc. (HRP) of Plainville, Connecticut has installed 14 overburden groundwater monitoring wells at the NEAP property [5; 58].

During the WESTON on-site reconnaissance, a drum storage area was observed at the loading dock (Figure 2) [3; 55]. Approximately 28 55-gallon drums were stored at the drum storage area [3; 55]. Several of the drums contained virgin materials and the remainder of the drums were empty [3; 55]. Additional temporary drum storage areas were observed in the production area, located in the central portion of the manufacturing building; and the baghouse, located along the interior west wall of the manufacturing building [55]. Two metal 1,500-gallon waste oil and one metal 1,000-gallon waste coolant bins are located along the exterior northeast wall of the manufacturing building. The metal bins are located on a concrete slab [55]. A 3,000-gallon metal hydroxide storage tank, placed on pallets, was located along the east exterior wall of the manufacturing building [55]. In addition, two 3,000-gallon metal hydroxide tanks were located at the southeast corner of the eastern parking lot [55]. Three fiberglass 1,500-gallon above ground storage tanks (ASTs) which reportedly contained waste oils are located along the interior east side of the manufacturing building [55].



BASED ON NUS/FIT SSI; FARMINGTON ASSESSOR'S MAPS 69 & 77; HRP REPORTS; AND WESTON FIELD OBSERVATIONS. NOT TO SCALE

LEGEND:

- SS-05 ● SOIL SEDIMENT SAMPLE (COLLECTED BY NUS/FIT, 10 JULY 1989)
- SD-01 ■ SEDIMENT SAMPLE LOCATION (COLLECTED BY NUS/FIT, 10 JULY 1989)
- O METAL HYDROXIDE STORAGE TANKS
- MW-4 ⊕ MONITORING WELL (INSTALLED BY HRP, APRIL 1992 AND JULY 1993)
- VV LANDSCAPED AREA
- TREE/WOODED AREA
- PROPERTY BOUNDARY
- (A) THREE 1,500-GALLON WASTE OIL ASTs
- LF 1 – LEACHFIELD No. 1 AREA
- LF 2 – LEACHFIELD No. 2 AREA
- (1) SEPTIC TANK No. 1
- (2) SEPTIC TANK No. 2
- [B] TWO 1,500 AND ONE 1,000-GALLON WASTE MATERIAL BINS
- DRAINAGE DITCH

SITE SKETCH

NEW ENGLAND AIRCRAFT PLANT #1 FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2

Based on available file information and discussions with facility representatives, two former on-site septic tanks and connected leachfields were located west of the NEAP manufacturing building (Figure 2) [55]. The first septic tank and associated leachfield (Septic/Leachfield No. 1) were identified as being located near the southwest corner of the manufacturing building, and the second septic tank and associated leachfield (Septic/Leachfield No. 2) were identified as being located north of Septic No. 1 (Figure 2) [3; 55]. The septic tanks were reportedly removed in 1978 when the manufacturing building was connected to the town sewer system; however, the leachfields have reportedly remained intact [1]. According to NEAP representatives, there are no drywells located on the property. In addition, a 1,000-gallon No. 2 fuel oil underground storage tank (UST) was located west of the manufacturing building and was reportedly removed in August 1984. A second 2,500-gallon No. 2 fuel oil UST is located by the southeast corner of the manufacturing building. This UST has been reportedly abandoned and still remains in place (Figure 2) [5; 55].

The nearest residence to the NEAP property is located approximately 750 feet south at 37 Wells Drive (Figure 1A) [3; 4]. The nearest verified private drinking water well to the property is located approximately 1.1 miles northwest of the NEAP property on Plainville Avenue in Farmington, Connecticut and serves an estimated three people [53]. The nearest public drinking water well is located approximately 0.28 miles northwest of the NEAP property (Figure 1A) [4; 31; 32]. This public drinking water well, known as the Wells Acres Well, is operated by the Unionville Water Company (UWC) and serves an estimated 457 people.

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Prior to development in 1961, the NEAP property and surrounding properties were used for agricultural purposes [1, p. 2]. NEAP began operating at its current location in 1961 [1, p. 2]. The property is currently owned and operated by IEP [3]. NEAP has been a manufacturer of jet aircraft engine blades and vanes since 1961 [3].

Processes at NEAP have remained relatively unchanged since 1961; however, chemicals used and wastes generated at the property may have varied throughout NEAP operational history due to industry technological advances. Processes currently used by NEAP include general machining; electro-chemical machining (ECM), which produces a metal hydroxide sludge; degreasing; and non-destructive testing using a Zyglo fluorescent penetrant inspection process [3; 57]. Zyglo contains 10 percent white mineral oil and 15 percent kerosene. Wastes currently generated on-site include cutting oils; waste acetone; sodium chloride electrolyte solution, with metal hydroxide sludge; anti-rust compounds; Zyglo solution rinsewater; and waste petroleum naphtha [3; 57]. The cutting oils are either recycled back into the machines or manifested off-site for disposal. The sodium chloride electrolyte solution is usually recycled after the metal hydroxide sludge has been removed, however, the sodium chloride electrolyte solution has been manifested off-site for disposal. The metal hydroxide sludge is manifested off-site. The anti-rust compounds and Zyglo solution rinsewaters are discharged to the Town of Farmington sanitary sewer system.

The ECM process uses a sodium chloride electrolyte solution and electric current to remove material from parts during machining processes. The spent ECM solution is pumped to three 3,000-gallon settling tanks to remove accumulated sludge [3]. The remaining liquid is then

pumped through two filter presses and two sludge dryers. The clarified liquid is fed back into the system for re-use. The accumulated sludge from the settling tanks is also processed through the filter presses and sludge dryers. A filter cake material is generated from this process. Reportedly, the filter cake is non-hazardous based on Toxicity Characteristic Leachate Procedure (TCLP) analysis [3]. Waste water soluble oils are currently manifested off-site by National Oil Service, Inc. (National Oil); ECM metal hydroxide sludge is manifested off-site by Environmental Waste Resources, Inc.; and the filter cake is manifested off-site by J.F. Partyke & Son, Inc. [56].

From 1961 to 1978, anti-rust compounds were discharged to the West Branch of Scott Swamp Brook along with rinsewater from the Zyglo penetrant inspection process [1]. On January 7, 1977, the CT DEP Water Compliance Unit (CT DEP/WCU) issued Order No. 2208 to NEAP, which required them to discontinue releasing wastewater to the West Branch of Scott Swamp Brook. NEAP complied with this order on May 10, 1978. According to an NEAP representative, after May 10, 1978, these wastes were discharged to the two on-site septic systems. The septic systems were reportedly used for on-site sanitary waste and permitted industrial wastewater disposal [1]. Both septic tanks were reportedly removed in late 1978, when the company was connected to the town sewer system; however, both leachfields were left intact. According to the Town of Farmington Building Department, the 36 Spring Lane property was not connected to the town sewer until May 6, 1981 [60]. It is assumed that the facility began discharging the anti-rust compound and the Zyglo rinsewaters to the town sewer system when the facility was connected, either in 1978 or in 1981.

Chloroethane was reportedly used on-site for parts cleaning from 1961 to 1991, and 1,1,1-TCA was used for the same purpose from 1961 to approximately 1990 [3; 5]. According to an NEAP representative, spent chloroethane and 1,1,1-TCA were manifested off-site and were not known to have been previously spilled or released at the property. Currently, parts cleaning is conducted on-site with mineral spirits and aqueous-based cleaners [55; 61].

A CT DEP investigation was initiated in 1980, when an anonymous caller stated that sludge was being dumped on the parking lot on the east side of the manufacturing building. CT DEP observed three NEAP employees dump ten cubic yards of dewatered sludge out of 55-gallon drums onto the east parking lot. An NEAP employee explained that this was a routine temporary disposal method on days when their waste hauler was scheduled to pick up the sludge. After being dumped on the parking lot, the sludge would be loaded into the waste hauler's truck using a front-end loader. CT DEP issued an order to NEAP stating that the current sludge disposal method was unacceptable and that the sludge must be stored in a concrete bin for temporary containment. NEAP subsequently complied with the order by constructing a concrete roll-off box.

In August 1981, a complaint was registered with the CT DEP by an NEAP employee who claimed that over the course of two to three years, 3,000 to 5,000 gallons of salt brine solution containing sodium hydroxide, hydrochloric acid, and cyanide had been dumped onto an unspecified gravel area and leached into the ground. This charge has never been confirmed.

In 1982, open drums of waste oil were observed within the manufacturing building during a CT DEP inspection with some spillage in the drum storage area; there was no berm in the drum storage area. The CT DEP inspector did not include the exact location of the drum storage area in the inspection report.

According to the NUS/FIT SSI, CT DEP collected samples in 1984 of the metal hydroxide sludge which was stored in the roll-off box. The samples were submitted to an analytical laboratory for Extraction Procedure (EP) Toxicity metals analysis [1, p. 7]. Several inorganic elements were detected. The results of the 1984 CT DEP metal hydroxide sludge sampling are further discussed in the Waste/Source Sampling Section of this report.

According to a 1992 HRP report, three aboveground waste oil tanks (bins) were removed from the north wall of the treatment shed in 1985 and re-installed approximately 15 feet north of the original location, near the northeast corner of the manufacturing building [5]. The removal occurred to accommodate a building addition in this area. Once the tanks were removed, soils from the area were excavated to a depth of approximately 14 to 15 feet. It is unknown whether the soil was excavated due to contamination or whether the excavation was necessary for the building addition. No information regarding the soil excavation, soil sampling data (if any) or final deposition of the soil was available [5].

On May 12, 1988, NEAP contracted National Oil to remove and dispose of accumulated waste oil which was stored on-site [1]. During the removal, the National Oil driver noticed a strong solvent odor apparently emanating from the waste oil [1]. The driver collected an unspecified number of samples of the waste oil for chemical analysis. National Oil subsequently informed NEAP that analytical data indicated that the waste oil contained chlorinated solvents, including tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-TCA. However, an NEAP representative, Mr. David Derynoski, claimed that PCE and TCE had not been used or stored on-site and that the presence of PCE and TCE in the waste oil was due to illegal dumping from an off-site source [59]. The NUS/FIT SSI indicated that 1,1,1-TCA was detected in the waste oil, and that this substance has been used and stored on-site from 1961 to 1990.

In response to this incident, the Farmington Police, Farmington Fire Marshal, and CT DEP were contacted by NEAP to investigate the allegations made by NEAP that illegal dumping into the waste oil storage tanks had occurred. The Farmington Police and the CT DEP reportedly concluded that the material was illegally dumped by an outside source; however, the alleged off-site source was not identified [1]. CT DEP approved the NEAP proposal for handling of the matter, including a plan for cleaning the storage tanks. The CT DEP incident report did not include a description of this plan. The Farmington Fire Marshal recommended increased security in the area of the tanks [1]. The results 1988 National Oil sampling are further discussed in the Waste/Source Sampling Section of this report.

In September 1988, NUS/FIT completed a Preliminary Assessment Report (PA) of the NEAP property [62]. The PA indicated that NEAP dumped metal hydroxide sludge, on a routine basis, in the parking lot east of the manufacturing building. NUS/FIT also reported that the facility was cited by the CT DEP for improper storage of the sludge, which contained barium, chromium, copper, nickel, and zinc [62]. NUS/FIT concluded that the metal contaminants detected in the on-site sludge could potentially contaminate groundwater and surface water. As a result, the PA recommended that the NEAP property be further evaluated to assess the potential threat to public health and the environment. NUS/FIT did not collect any samples on the NEAP property as part of the PA investigation [62].

In July 1990, NUS/FIT completed an SSI of the NEAP property [1]. Following an on-site reconnaissance, NUS/FIT collected eight soil and two sediment samples from the NEAP property on July 10, 1989. The samples were collected to characterize on-site sources and to evaluate the possibility of releases to the environment from these sources (Figure 2) [1, p. 7]. Samples were submitted through the EPA Contract Laboratory Program (CLP) for target compound list organics and target analyte list elements [1, p. 7]. Nine semivolatile organic compounds (SVOCs) and five inorganic elements were detected in soil and sediment samples collected by NUS/FIT. The results of the 1989 NUS/FIT sampling are discussed in the Waste/Source Sampling, Surface Water Pathway Section of this report.

In June 1991, HRP completed a Phase I Environmental Site Contamination Assessment Report (Phase I) on the NEAP property. As part of the Phase I, HRP submitted a Scope of Study to the CT DEP [5]. In December 1991, NEAP began using two filter presses and sludge dryers, replacing the vacuum dewatering system (diatomaceous earth drum filter process) previously used. NEAP continues to pump ECM metal hydroxide solution from the system into the settling tanks. The sludge is then processed through one of the filter presses and sludge dryers. The filter cake generated is non-hazardous based on TCLP testing and is transported off-site for disposal [1; 5].

In April and May 1992, HRP installed eight groundwater monitoring wells at the NEAP property including one upgradient monitoring well (Figure 2) [5; 58]. In addition to the installation of the monitoring wells, HRP advanced two soil borings at each of the two former leachfields, and collected surficial soil samples in potential source areas [5; 58].

In July 1993, HRP installed an additional six groundwater monitoring wells at the NEAP property to address concerns presented by the CT DEP that releases of sodium chloride solution at the property and the degraded groundwater quality in the general vicinity caused by halogenated organic contaminants needed further evaluation. The six monitoring wells were installed on the eastern portion of the property (Figure 2) [5; 58].

From 1991 to 1994, HRP conducted four environmental investigations at the NEAP property to evaluate on-site sources of contamination. During this period, numerous groundwater samples, soil samples, and surface water samples (from the West Branch of Scott Swamp Brook) were collected [5; 58]. These investigations are discussed in further detail in the Waste/Source Sampling, Groundwater Pathway, and Surface Water Pathway Sections of this report.

On June 29, 1995, WESTON conducted an on-site reconnaissance at the NEAP property and reviewed records of hazardous waste generation and shipping manifests [3]. According to available file information, hazardous wastes currently generated at the property include; 1,1,1-TCA, metal hydroxide sludge, waste cutting oil, acetone, sodium chloride, and naphtha [54]

On July 12, 1995, WESTON collected eleven groundwater, 21 sediment and two surface water samples at locations up-gradient and down-gradient of the NEAP property [53]. WESTON samples were submitted through the EPA CLP for VOC, SVOC, pesticide/polychlorinated biphenyl (PCB), total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory [51]. The results of this sampling event are summarized in the Groundwater and Surface Water Pathway Sections of this report.

There are presently eight potential source areas at the NEAP property. These include the two leachfields; drum storage areas; the abandoned 2,500-gallon No. 2 fuel oil UST and a removed 1,000-gallon No. 2 fuel oil UST; two 1,500-gallon waste oil bins and one 1,000-gallon waste oil bin; three 3,000-gallon metal hydroxide storage tanks; three fiberglass 1,500-gallon waste oil ASTs; and an area of contaminated soil which is based on past dumping practices and analytical results from on-site soil samples (Figure 2) [1; 3; 5; 55]. No other treatment, storage or disposal activities are known to have occurred at the property which have resulted in additional source areas. Table 1 presents the structures or areas identified on the NEAP property which are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source [1; 3; 5; 55].

Table 1

Source Evaluation for New England Aircraft Plant #1

Source Area	Containment Factors	Spatial Location
Two Leachfields (Leachfield No. 1/ Leachfield No. 2)	Designed to release wastewater to groundwater without treatment. The leachfields are buried beneath more than two feet of soil. Therefore, they are contained with regard to potential surficial soil and air releases. There are currently 14 groundwater monitoring wells in place on the property.	Leachfield No. 1 is located along the southwest corner of the manufacturing building, and Leachfield No. 2 is located west of the manufacturing building.
Drum Storage Areas	Drums are kept in the manufacturing building. No floor drains were observed in the drum storage areas. Hazardous substance migration from these areas are assumed to be contained with regard to potential groundwater, surface water, and surficial soil. There are currently 14 groundwater monitoring wells in place on the property.	Adjacent to the loading dock on the southeast corner of the manufacturing building, and several locations throughout the manufacturing building.
Abandoned 2,500-gallon No. 2 Fuel Oil UST/ Former 1,000-gallon No. 2 Fuel Oil UST	An abandoned 2,500-gallon UST of unknown construction is allegedly buried beneath more than two feet of soil. A former 1,000-gallon UST of unknown construction was allegedly buried beneath more than two feet of soil. The USTs are therefore contained with regard to potential surficial soil, and air releases. There are currently 14 groundwater monitoring wells in place on the property.	The abandoned 2,500-gallon UST is located at the southeast corner of the manufacturing building. The 1,000-gallon UST was located west of the manufacturing building but was reportedly removed in 1984.
Two 1,500-gallon waste oil bins and One 1,000-gallon waste oil bin	The three waste storage bins are of steel construction. The bins are located on a concrete slab outside the manufacturing building surrounded by a locked six-foot high fence. Hazardous substance migration from this source is potentially available to all pathways. There are currently 14 groundwater monitoring wells in place on the property.	Northeast exterior wall of the manufacturing building.

Table 1

Source Evaluation for New England Aircraft Plant #1 (concluded)

Source Area	Containment Factors	Spatial Location
One 3,000-gallon Metal Hydroxide Storage Tank	The 3,000-gallon tank is of steel construction and is designed to store liquid wastes prior to off-site removal. The 3,000-gallon tank is on wooden pallets, and any hazardous substance migration from this source is potentially available to all pathways. There are currently 14 groundwater monitoring wells in place on the property.	East exterior wall of the manufacturing building.
Two 3,000-gallon Metal Hydroxide Storage Tanks	The two 3,000-gallon tanks are of steel construction and are designed to store liquid wastes prior to off-site removal. The 3,000-gallon tanks are placed directly on the asphalt parking lot, and any hazardous substance migration from this source is potentially available to all pathways. There are currently 14 groundwater monitoring wells in place on the property.	Southeast corner of eastern parking lot.
Three 1,500-gallon Waste Oil ASTs	The three fiberglass 1,500-gallon waste oil ASTs are designed to store waste oil prior to off-site removal. No floor drains were observed in the vicinity of the ASTs. The three 1,500-gallon ASTs are inside the manufacturing building; therefore, they are contained with regard to potential surficial soil, surface water, and groundwater releases. There are currently 14 groundwater monitoring wells in place on the property.	Located along the interior east side of the manufacturing building.
Contaminated Soil	None; available to all pathways.	The area of contaminated soil is based on past dumping practices at the NEAP property and soil sampling results.

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, generated, or stored on the NEAP property [54; 56; 57; 61].

Table 2

Hazardous Waste Quantity for New England Aircraft Plant #1

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Sodium Chloride Electrolyte Solution	Unknown	1961 - present	Unknown	ECM process; ASTs.
Metal Hydroxide Sludge	100,000 lbs/year	1961 - present	1961 - 1980	Dumping on east parking lot.

Table 2

Hazardous Waste Quantity for New England Aircraft Plant #1 (concluded)

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Anti-rust Compounds	Unknown	1961 - present	1961 - 1978 1978 - 1981	West Branch of Scott Swamp Brook Septic System**
Zyglo Rinsewater	Unknown	1961 - present	1961 - 1978 1978 - 1981	West Branch of Scott Swamp Brook Septic System**
Chloroethane	Unknown	1961 - 1991	Manifested off-site	Unknown
1,1,1-TCA	750 gallons/year	1961 - 1990	Unknown	USTs, drums, ASTs, contaminated soil.
Waste Oil***	12,000 gallons/year	1961 - present	Unknown	ASTs northeast corner of manufacturing building.
Mineral Spirits/Naphtha	50,000 lbs/year	Unknown	Unknown	ASTs and drum storage areas.
Waste Acetone	220 gallons/year	Unknown	Unknown	Drum storage areas.

* = Also referred to as ECM Process Water.
** = Conflicting reports as to when the property was connected to the municipal sewer system. The waste may in fact have been disposed to the municipal sewer system.
*** = Waste oil has been documented to contain PCE, TCE, and 1,1,1-TCA from alleged vandalism.

Waste quantities and volumes used above are approximations calculated from available file information.

As of July 1995, 21 CERCLA properties were located in Farmington, Connecticut and 17 CERCLA properties were located in Plainville, Connecticut. Of these, 26 were noted to be located within one mile of the FIP [8]. As of July 1995, 31 RCRA notifiers were located in Farmington, Connecticut and 47 RCRA notifiers were located in Plainville, Connecticut. Of these, 23 were noted to be located within one mile of the FIP [9]. The NEAP property was entered into CERCLIS on March 16, 1988. NEAP notified the EPA as a Large Quantity Generator on August 18, 1980. Table 3 presents a summary of properties located in the FIP which are the subject of current CERCLA SIP investigations conducted by WESTON (Figure 1B). Table 3 also provides a description of the types of potentially hazardous substances which have been disposed, used, generated, or stored on these properties.

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Dell Manufacturing Co. CTD001139336	Dell manufactures jet engine parts.	1,1,1-Trichloroethane (1,1,1-TCA) Acid etching wastewater Paint waste Waste oils Waste cooling water Wastewater	1967 to March 1995 1967 to 1981 1967 to present 1967 to present 1991 to present 1967 to unknown	Unknown 1967 to 1981 Off-site disposal Off-site disposal Unknown Unknown	UST; drum storage area Drywell Drum storage area 4,000-gallon UST Drywell Septic system
Edmunds Manufacturing Co. CTD054187455	Edmunds manufactures gauges for commercial and industrial uses.	Trichloroethylene (TCE) 1,1,1-TCA Untreated process rinse wastewaters Waste oil Plating wastes	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	Drywell; leach field Drywell; leach field 4,000-gallon UST 3,000-gallon UST UST
Fletcher-Terry Co. CTD001145309	Fletcher manufactures glass cutting tools.	Nitrating salts Waste rinse water Waste cutting oils Grinding sludge 1,1,1-TCA	1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown	1969 to 1975 1969 to 1975 1969 to 1982 1969 to unknown 1969 to 1980	Septic system Septic system Drywell Unknown Drywell
Gros-ite Industries, Inc. CTD982543670	Gros-ite manufactures aircraft parts, machines, machine prototypes, and environmental chambers.	Waste oils Tetrachloroethylene (PCE)	1954 to 1991 1954 to 1976	1954 to 1991 1954 to 1976	3,000 and 1,000-gallon UST Leach field to ground
KIP, Inc. CTD064844426	The KIP property was initially developed by the Sureline in November of 1969. From 1969 to 1974, Sureline produced experimental and reconditioned machinery. KIP has been manufacturing solenoid valves at this location since 1983.	TCE Cutting oils and sludge	Unknown 1969 to 1988 Unknown	Unknown 1969 to 1988 Unknown	Unknown 500-gallon UST; concrete UST; drywell 500-gallon UST; concrete UST; drywell

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
ESCO Laboratories, Inc. CTD001139310	ESCO, also known as Perma-Type Rubber Company manufactures rubber surgical equipment and surgical cement.	Acetone	1969 to unknown	1969 to unknown	Rear of original building
		Chlorobutane	1969 to unknown	1969 to unknown	Rear of original building
		Ethyl alcohol	1969 to unknown	1969 to unknown	Rear of original building
		Methyl cyclohexane	1969 to unknown	1969 to unknown	Rear of original building
		Methyl iso-butyl ketone	1969 to unknown	1969 to unknown	Rear of original building
		Toluene	1969 to unknown	1969 to unknown	Rear of original building
		Methane	1969 to unknown	1969 to unknown	Rear of original building
		Butane	1969 to unknown	1969 to unknown	Rear of original building
		Propane	1969 to unknown	1969 to unknown	Rear of original building
		Hexane	1969 to unknown	1969 to unknown	Rear of original building
		TCE	1969 to unknown	1969 to unknown	Rear of original building
		1,1,1-TCA	Unknown to 1985	Unknown to 1985	Sanitary sewer
		Phthalate	Unknown	Unknown	Unknown
		Total Petroleum Hydrocarbon (TPH)	Unknown	Unknown	Unknown
Brown Manufacturing CTD001149038	Brown manufactures screw machine products.	1,1,1-TCA	1967 to 1983 1983 to 1987	1967 to 1983 Off-site disposal	Drywell Drum storage area
		Mineral Spirits	1967 to 1983 1983 to 1988 1988 to present	1967 to 1983 Off-site disposal Recycled on-site	Drywell Drum storage area Recycling still
		PCE	1967 to 1983 1983 to 1988 1988 to present	1967 to 1983 Off-site disposal Recycled on-site	Drywell Drum storage area Recycling still
		Cutting Oil	1977 to unknown Unknown to present	Off-site disposal Recycled on-site	2,000-gallon UST Oil extractor centrifuge

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Whitnon-Spindle CTD052538105	Whitnon manufactures ballbearing and oil hydrostatic spindles.	Industrial waste stream (containing 1,1,1-TCA)	1955 to 1979 1979 to 1986 1979 to 1991	1955 to 1979 Off-site disposal Off-site disposal	Surface soil, drywell 1,000-gallon UST 2,000-gallon UST
		Water soluble coolant waste	1991 to present	Off-site disposal	2,000-gallon UST
		Scrap metal soaked with cutting oil	Unknown to present	Off-site disposal	30-yard open roll-off container
		Waste machine oil	1955 to 1979 1979 to present 1994 to present	Unknown Off-site disposal Off-site disposal	Unknown Drum storage area 1,000-gallon UST
American Tool & Manufacturing Corporation CTD001148949	American Tool performs general metal machining.	Trichloroethylene TPH	1968 to 1980 Unknown	1968 to 1980 Unknown	Oil/water separator tank Septic system
Connecticut Spring and Stamping Corporation CTD001143007	CSSC manufactures coil and torsion springs and wire forms.	Acidic wastewater Tumbling wastewater Heat quenching wastewater Tetrachloroethylene Trichloroethylene Waste oil Waste oil	1961 to 1974 1961 to 1974 1961 to 1974 1961 to present 1961 to unknown 1961 to 1972 1961 to present	1961 to 1974 1961 to 1974 1961 to 1974 Unknown 1961 to unknown Unknown Unknown	SE septic tank and leach field SE septic tank and leach field SE septic tank and leach field UST east of building UST east of building UST inside building UST northwest of building

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Mallory Industries, Inc. CTD001148568	Mallory manufactures cams for aircraft and other industry.	Tumbling wastewater Water soluble oils Mineral spirits Alkaline soap solution Nitric acid Phosphoric acid Waste oil Solvents Waste oil	1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1983 to 1995 1983 to 1992 1976 to 1983	1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 Unknown Unknown Unknown	Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Abandoned waste oil UST Abandoned waste solvent UST Removed waste oil UST
New England Aircraft Plant #1 CTD059831479	NEAP #1 manufactures jet aircraft engine blades and vanes.	Anti-rust compound Zyglo solution Fluorescent penetrant rinse waters Metal hydroxide sludge TPH TPH TPH and waste oil Sodium chloride	1961 to present 1961 to present 1961 to present 1961 to present Unknown Unknown 1977 to present 1961 to present	1961 to 1981 1961 to 1981 1961 to 1981 1961 to 1980 Unknown Unknown Unknown Unknown	Two septic systems Two septic systems Two septic systems Eastern parking lot Loading dock area Air compressor area Waste oil ASTs ECM treatment shed
New England Aircraft Plant #2 CTD982710535	NEAP #2 manufactured jet aircraft engine parts.	Spent chromic acid (CrO_3) Waste solvents	1963 to 1976 1963 to 1976	1963 to 1976 1963 to 1976	Drywell Drywell
Roy Machinery and Sales CTD001143957	Roy performs general metal machining; paint spraying; cleaning; testing.	Unspecified industrial wastes Agitene	1957 to 1976 Unknown	1957 to 1976 Unknown	Septic system Ground west of building

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (concluded)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Mott Metallurgical Corp. CTD980524193	Mott manufacture sintered metallic filters.	1,1,1-TCA	1969 to 1975	1969 to 1975	Drywell
		MEK	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Acetone	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs Drum storage area
		Propanol	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs Drum storage area
		Waste machine oil	1979 to present	Off-site disposal	Drum storage area
		Phosphoric acid	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Nitric Acid	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Metal salts	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST

WASTE/SOURCE SAMPLING

There are presently eight potential source areas at the NEAP property. These include the two leachfields; drum storage areas; the abandoned 2,500-gallon No. 2 fuel oil UST and a removed 1,000-gallon No. 2 fuel oil UST; two 1,500-gallon waste oil bins and one 1,000-gallon waste coolant bin; three 3,000-gallon metal hydroxide storage tanks; three fiberglass 1,500-gallon waste oil ASTs; and an area of contaminated soil which is based on past dumping practices and analytical results from on-site soil samples (Figure 2) [1; 3; 5; 55]. No other treatment, storage or disposal activities are known to have occurred at the property which have resulted in additional source areas.

According to the NUS/FIT SSI, CT DEP collected samples in 1984 of the metal hydroxide sludge which was stored in the roll-off box. The samples were submitted to an analytical laboratory for EP Toxicity metals analysis [1, p. 7]. The analytical results reported chromium at 0.75 parts per billion (ppb), copper at 0.13 ppb, nickel at 240 ppb, zinc at 0.13 ppb, and barium at 0.29 ppb [1, p. 7]. No other information was available on the 1984 CT DEP metal hydroxide sludge sampling.

On May 12, 1988, NEAP contracted National Oil to remove and dispose of accumulated waste oil which was stored on-site [1]. During the removal, the National Oil driver noticed a strong solvent odor apparently emanating from the waste oil [1]. The driver collected an unspecified number of samples of the waste oil for chemical analysis. The exact analytical method used is not known. National Oil subsequently informed NEAP that the waste oil contained PCE at 1,787 parts per million (ppm), TCE at 820 ppm, and 1,1,1-TCA at 120 ppm [1, p. 7]. However, an NEAP representative, Mr. David Derynoski, claimed that PCE and TCE had not been used or stored on-site and that the presence of PCE and TCE in the waste oil was due to illegal dumping from an off-site source [59]. The NUS/FIT SSI indicated that 1,1,1-TCA was detected in the waste oil, and that this substance had been used and stored on-site from 1961 to 1990.

On July 10, 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the NEAP property as part of the SSI [1]. NUS/FIT collected a total of eight soil samples to evaluate the NEAP property, including a background soil sample (SS-06), a replicate and duplicate soil sample (SS-02R/D), and a trip blank (SS-07) (Figure 2) [1, Table 3]. Samples were submitted through the EPA CLP for target compound list organics and target analyte list elements [1, p. 7]. Pesticide/PCB analyses were not performed. Soil sample SS-06 was chosen as a background sample location because it was not associated with any known sources at the property and was collected from an area which was apparently undisturbed by on-site operations. Table 4 summarizes NUS/FIT soil samples collected to evaluate the NEAP property [1, p. 7].

Table 4

Source Sample Summary: New England Aircraft Plant #1, Samples Collected by NUS/FIT on July 10, 1989

Sample Location No.	Traffic Report No.	Remarks	Sample Source
MATRIX: SOIL			
SS-01	AQ001 MAL729	Grab (1.5 feet)	Soil sample collected from Leachfield No. 2 located west of the manufacturing building.
SS-02	AQ002 MAL730	Grab (1.8 feet)	Soil sample collected from Leachfield No. 1 located southwest of the manufacturing building.
SS-02R/D	AQ010 MAL737	Grab (1.8 feet)	Replicate and duplicate (R/D) of soil sample SS-02.
SS-03	AQ003 MAL731	Grab (0.75 feet)	Soil sample collected approximately 22.7 feet northwest of the southwest corner of the manufacturing building.
SS-04	AQ004 MAL732	Grab (0.5 feet)	Soil sample collected approximately 22.3 feet northwest of the southeast drainage ditch.
SS-05	AQ005 MAL733	Grab (0.5 feet)	Soil sample collected approximately 39.3 feet northeast of the edge of the parking lot near the northeast drainage ditch.
SS-06	AQ006 MAL734	Grab (0.5 feet)	Background soil sample collected approximately 103 feet northeast of the northwest corner of the manufacturing building.
SS-07	AQ007	Grab	Soil blank sample collected for quality control.

Table 5 is a summary of organic compounds and inorganic elements detected through CLP analyses of NUS/FIT source samples [1, pp. 7-8]. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (SS-06). However, if the compound or element is not detected in the reference sample, the reference sample's quantitation limit (SQL) (for organic analyses) or detection limit (SDL) (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 5

Summary of Analytical Results, Source Sample Analysis for New England Aircraft Plant #1: Samples Collected by NUS/FIT on July 10, 1989

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SS-03 (AQ003) (MAL731)	**SVOCS**			
	Phenanthrene	310 J µg/kg	90 J µg/kg	3.4 × REF
	Fluoranthene	680 J µg/kg	170 J µg/kg	4.0 × REF
	Pyrene	480 J µg/kg	130 J µg/kg	3.7 × REF
	Chrysene	310 J µg/kg	85 J µg/kg	3.6 × REF
	Benzo(b)fluoranthene	460 J µg/kg	82 J µg/kg	5.6 × REF
	Benzo(a)pyrene	350 J µg/kg	66 J µg/kg	5.3 × REF
	Indeno(1,2,3-cd)pyrene	280 J µg/kg	50 J µg/kg	5.6 × REF
	Benzo(g,h,i)perylene	300 J µg/kg	52 J µg/kg	5.8 × REF
	INORGANICS			
	Calcium	1,250 mg/kg	348 mg/kg	3.6 × REF
SS-04 (AQ004) (MAL732)	**SVOCS**			
	Phenanthrene	300 J µg/kg	90 J µg/kg	3.3 × REF
	Fluoranthene	670 J µg/kg	170 J µg/kg	3.9 × REF
	Pyrene	520 J µg/kg	130 J µg/kg	4.0 × REF
	Chrysene	290 J µg/kg	85 J µg/kg	3.4 × REF
	Benzo(b)fluoranthene	470 J µg/kg	82 J µg/kg	5.7 × REF
	Benzo(k)fluoranthene	200 J µg/kg	61 J µg/kg	3.3 × REF
	Benzo(a)pyrene	330 J µg/kg	66 J µg/kg	5.0 × REF
	Indeno(1,2,3-cd)pyrene	310 J µg/kg	50 J µg/kg	6.2 × REF
	Benzo(g,h,i)perylene	300 J µg/kg	52 J µg/kg	5.8 × REF
	INORGANICS			
	Calcium	1,610 mg/kg	348 mg/kg	4.6 × REF
	Chromium	124 J mg/kg	22.2 J mg/kg	5.6 × REF
	Copper	43.6 mg/kg	10.9 J mg/kg	4.0 × REF

Table 5

Summary of Analytical Results, Soil Sample Analysis for New England Aircraft Plant #1: Samples Collected by NUS/FIT on July 10, 1989 (concluded)

Sample Location	Compound/Element	Sample Concentration		Reference Concentration		Comments
SS-04 (concluded)	Nickel	308	mg/kg	11.8	mg/kg	26.1 × REF
	Sodium	316	mg/kg	59.1	mg/kg	5.3 × REF
SS-05 (AQ005) (MAL733)	**INORGANICS**					
	Calcium	1,410	mg/kg	348	mg/kg	4.1 × REF
	Nickel	45.2	mg/kg	11.8	mg/kg	3.8 × REF

µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
REF = Reference value.
J = Value associated with this concentration is estimated.

No VOCs were detected at three times the reference sample concentration or equal to or greater than the SQL in on-site soil samples collected by NUS/FIT; however, nine SVOCs were detected ranging between 3.3 (phenanthrene) and 6.2 (indeno(1,2,3-cd)pyrene) times the reference sample concentration [1, Attachment D]. In addition, five inorganic elements were detected ranging between 3.6 (calcium) and 26.1 (nickel) times the reference sample concentration [1]. The nine SVOCs as well as the inorganic element chromium were reported in on-site soil samples as estimated values. WESTON has included the detected estimated concentrations of these substances to remain consistent with technical directives provided by EPA-New England. The complete analytical results of the 1989 NUS/FIT SSI sampling event are included in Attachment A.

Analytical results from NUS/FIT soil sample SS-03, collected downslope of former Septic Tank No. 1, reported eight SVOCs and one inorganic element [1]. In addition, nine SVOCs and five inorganic elements were detected in NUS/FIT soil sample SS-04, collected from the southeast drainage ditch, where overland flow is directed from portions of the eastern parking lot (the documented sludge disposal area) [1]. NUS/FIT soil sample SS-05, collected from the northeast drainage ditch, where overland flow is directed from portions of the eastern parking lot, reported two inorganic elements [1].

The NUS/FIT SSI reported that the concentrations of detected SVOCs in on-site soil samples were not considered high for samples collected near paved areas. The detection of inorganic elements chromium, copper, and nickel in on-site soil samples was consistent with the detection of these substances in the 1984 CT DEP metal hydroxide sludge samples. The SSI also indicated

that the detected inorganic elements may be attributable to the documented dumping of metal hydroxide sludge onto the eastern parking lot [1].

From 1992 through 1994, HRP conducted four environmental investigations at the NEAP property to evaluate on-site sources of contamination [5]. During this two year period, soil samples were collected from the property [5]. Abbreviated summaries of HRP investigations follow.

In 1992, the CT DEP requested that HRP conduct sampling at the NEAP [5]. As part of the CT DEP request, HRP collected several surficial composite soil samples and soil boring soil samples from the NEAP property. HRP soil samples were reportedly submitted to a State-certified laboratory for VOC analyses using EPA Methods 8010 , 8015, and 8020; and metals analyses for barium, cadmium, chromium, lead, mercury, nickel, copper, zinc, cyanide, and sodium chloride [5]. No known reference samples were collected as part of this sampling event.

Surficial composite soil samples collected by HRP on May 4, 1992 detected the following: copper (0.04 mg/L) and TPH (18,790 mg/L) from the air compressor blow-down area; nickel (0.21 mg/L) from the southeast drainage ditch; and zinc (0.17 mg/L) from the second drainage ditch area located on the northeast corner of the property. The exact sample depths could not be determined from available file information. In addition, barium was detected at 1.17 milligrams per liter (mg/L) from the soil boring sample collected in Leachfield No. 2 from a depth of approximately 4 to 6 feet [5]. No VOCs were detected in any of the soil samples submitted for analysis [5].

HRP sampling events at the NEAP property are further discussed in the Groundwater Pathway and Surface Water Pathway Sections of this report. The complete analytical results of the HRP sampling events are included in Attachment B. Based on available file information, no other known on-site source sampling has occurred at the NEAP property.

GROUNDWATER PATHWAY

Prior to 1961, the NEAP property was used as farmland [1, p. 2]. Soil maps for Hartford County report the soil type at the NEAP property as Hinckley Merrimac, an excessively drained soil with sandy and gravely substratum on terraces [12]. Surficial geology of the area beneath the NEAP property has been mapped as glacial collapsed stratified drift deposits [12]. These deposits are associated with deltaic deposits comprised of stratified sand and gravel, overlying glacial till. The occurrence of sand and gravel in the deposits indicates that the overburden permeability at the property is moderate to high. The underlying glacial till is presumed to be present continuously beneath sand and gravel throughout the Pequabuck River Valley within a two-mile radius of the property, based on its occurrence in all of the boring logs for monitoring wells installed in the vicinity of Scott Swamp Brook and the Pequabuck River [14, Appendix 1].

Bedrock geology beneath the property has been mapped as Triassic New Haven Arkose, which makes up a large part of the Central Lowlands of Connecticut. The New Haven Arkose is a reddish, poorly-sorted sandstone and conglomerate. This central region of Connecticut contains

several large fault zones that strike approximately North 50° East, with dip angles near vertical [13]. An inactive private groundwater production well, located approximately 0.53 miles south of the NEAP property is completed in bedrock at a depth of approximately 165 feet below ground surface (bgs). The well was noted to exist under flowing artesian conditions (with a potentiometric surface above the ground surface) by WESTON on April 17, 1995 [14, p. 48; 15]. The top of the overburden water table at this location is approximately 30 feet bgs [15]. These observations indicate that the potentiometric surface in the bedrock is greater than that in the overburden by at least 30 feet. Therefore, groundwater flow between the two units would tend to be from the higher potentiometric surface to the lower, in this case, from bedrock to overburden [14, pp. 21, 48-49; 15].

Additional information regarding subsurface conditions at the NEAP property was obtained from boring logs provided by HRP [5]. During the HRP on-site investigations, soil borings were advanced by East Coast Drilling & Boring, Inc. (East Coast) of Wallingford, Connecticut [5]. According to the information provided by East Coast, a total of twelve soil borings were advanced on April 22 - 24, 1992 [5]. Eight of the soil borings were completed with wells. Boring logs for six additional borings advanced in July 1993 were not available. The 1992 boring logs provided by East Coast indicate that subsurface materials at the NEAP property are composed primarily of coarse sand and gravel with trace amounts of silt [5]. Groundwater beneath the property was reportedly encountered between 12.5 and 27 feet bgs [5].

Overburden becomes much thicker, approximately 0.1 miles east of the NEAP property where a glaciolacustrine varved silt and clay unit, between 86 and 205 feet thick and one mile wide, occurs within the overburden. This layer partially separates unconfined and confined portions of the Pequabuck River Valley overburden aquifer [14, pp. 22, Figure 7]. Although the silt and clay layer strongly restricts groundwater flow between the two parts of the overburden aquifer, aquifer tests have demonstrated interconnection between the unconfined and confined parts of the overburden aquifer, in particular in the stratified drift deposits located north and west of the FIP and Johnson Avenue wells [14, p. 22]. The NEAP property is located above stratified drift deposits northwest of these wells, in an area noted to be a recharge area for the lower portion of the Pequabuck River Valley overburden aquifer [14, p. 22]. Further, since the silt and clay layer is not present beneath the NEAP property, the silt and clay layer does not meet the CERCLA definition of a confining layer [20, p. 51601; 16, Figure 7].

Typical hydraulic conductivities for sand and gravel range from 10^{-4} to 10^{-2} centimeters per second (cm/s), typical hydraulic conductivities for glacial till range from 10^{-6} to 10^{-4}, and typical hydraulic conductivities for fractured sedimentary rock are approximately 10^{-4} cm/s [20, p. 51601]. For the purposes of this report, the glacial till which underlies the Pequabuck River Valley overburden aquifer is considered to constitute a continuous, low-permeability layer which separates overburden and bedrock aquifers beneath the property and throughout the aquifer [20, p. 51601]. Further, the observed hydraulic gradient between the overburden and bedrock aquifers in the vicinity of the FIP indicates that groundwater flow between the two aquifers would be primarily from bedrock to overburden. While it is possible that contaminant flow from the overburden to the bedrock aquifer may occur under the overall groundwater flow regime if dense non-aqueous phase liquid is present, existing hydrogeological data, as well as analytical data support an aquifer discontinuity [16, p. 5; 14, pp. 21, 48-49].

The Pequabuck River Valley overburden aquifer, in the vicinity of Scott Swamp Brook, is bordered to the west by collapsed stratified drift, kame, and glacial till deposits, to the east by bedrock outcrops. The Pequabuck River Valley overburden aquifer begins at the Quinnipiac River Valley in the south, and terminates beneath the Farmington River in Avon, Connecticut [14, p. 22]. The direction of groundwater flow within the Pequabuck River Valley overburden aquifer during the pumping of the public water supply wells located southeast of the NEAP property was radially toward these wells. Beneath the NEAP property, the direction of groundwater flow is assumed to be east-southeast, flowing toward the FIP and Johnson Avenue wells [14, Figure 9]. Average rainfall for the Town of Farmington is 49.06 inches per year [10].

All or part of the following Connecticut cities and towns are located within four radial miles of the FIP properties: Bristol (population 60,640), Burlington (population 7,026), New Britain (population 72,513), Farmington (population 20,608), Plainville (population 17,197), and Southington (population 38,000) [17, pp. 63-64; 35; 36; 37; 38].

The Bristol Water Department (BWD) of the Town of Bristol operates two separate public water supplies. One is located in the western part of the town, and relies on combined groundwater and surface water sources located more than four radial miles and 15 downstream miles from the property [18, p. 50; 21; 22]. The second supply is located in the northeastern part of the town and serves 20,000 persons. The supply obtains water from four wells located within four miles of the property. BWD Well No. 2 is drilled in overburden 75 feet deep and is located approximately 2.42 miles southwest of the property, and supplies 50 percent of the total supply [18, p. 50; 21; 22]. The other 50 percent of the supply (no further breakdown is available) is obtained from the three Mix Street Wells, which are overburden wells, 55 feet deep, and are located approximately 2.81 miles northwest of the property [18, p. 50; 22]. For the purposes of this report, the three Mix Street Wells are assumed to contribute equally to the system, and each serve 3,334 persons [38]. The remainder of the population of Bristol is presumed to rely on private drinking water wells and groundwater sources from outside of the four-mile radius to the property.

A small section of the southeast corner of the Town of Burlington is located within the four-mile radius. No major public water supplies have been identified in this area; however, there are two community water supplies in that area of Burlington: the Farmington Line West Condominium Well, 2.71 miles northwest of the property, as well as the Woodcrest Association Well, which is 2.81 miles northwest of the property. The wells serve 34 and 60 persons, respectively; no data regarding depths is available [19; 21; 26; 27]. The remainder of the Town of Burlington relies on private wells.

Four public water supplies provide drinking water to most of the residents of Farmington [28]. The New Britain Water Department (NBWD) supplies water to an estimated 90,677 persons, including residents of Farmington, Kensington, New Britain, Newington and Plainville. The supply is provided by seven groundwater wells and six reservoirs which are not located downstream of the FIP properties [18, p. 51; 39]. One pair of overburden groundwater wells, known as the White Bridge Wells and operated by the NBWD, is located approximately 2.22 miles west of the property [21; 39]. The White Bridge Wells provide 28.6 percent of the total annual water supply and serve 25,900 persons.

The Metropolitan District Commission (MDC) supplies water to some residents of Farmington, as well as other communities in the greater Hartford area. The supply is provided from reservoirs which are not located downstream of the FIP properties [18, pp. 35, 36; 28].

The Plainville Water Company (PWC) provides drinking water to residents of Farmington and Plainville. The PWC maintains a blended system of five overburden wells which serves a total of 20,000 people. Prior to distribution, water from these wells is air-stripped. The two PWC overburden wells located between 0.47 and 0.49 miles southeast of the property are known as the Johnson Avenue Wells Nos. 6 and 3 respectively, and account for 27.4 percent of the system's annual total water supply, and serve an estimated 5,480 persons [21]. These wells are screened in the lower portion of the Pequabuck River Valley overburden aquifer, at depths of 80 to 93 and 92 to 110 feet bgs, respectively [14, Appendix 1]. The three PWC wells located 2.32 miles southeast of the property are known as the Woodford Avenue Wells and supply 72.6 percent of the system's annual total water supply, serving an estimated 14,520 persons [18, p. 51; 22; 29; 30; 32]. These wells are also screened in the Pequabuck River Valley overburden aquifer, at a point up-gradient of the FIP area [18, p. 51; 14, Figures 3 and 5].

The UWC provides drinking water to many residents in Farmington. The UWC system consists of eight wells at four locations in Farmington. Of these eight wells, five are located greater than four radial miles of the property. None of these eight wells are completed in the Pequabuck River Valley overburden aquifer, although the Wells Acres Well, which is screened in bedrock, is located 0.28 miles northwest of the property [18, p. 51]. The Wells Acres Well was sampled by WESTON on July 12, 1995; the analytical results from the well are discussed in the Groundwater Pathway Section of this report [53, p. 16].

The UWC also maintains four wells which provide water to the FIP; named FIP Nos. 1 through 4. Available information suggests that this water is used for both manufacturing processes and potable purposes at the FIP. Several businesses in the FIP use bottled drinking water. The FIP wells serve an estimated 1,026 workers at businesses within the FIP [40]. The wells are located immediately southeast of the FIP (Figure 1B) [18, p. 35; 31; 39]. The annual contribution of each well to the system is based on 1994 annual production figures [21; 33]. All four of the wells are screened in the lower portion of Scott Swamp Brook Valley overburden aquifer [14, pp. 3-4]. The UWC maintains the Connecticut Sand & Stone Well located in Farmington, 2.78 miles northeast of the property which serves an estimated 2,792 persons [21; 23; 31]. The UWC also maintains the Pondwood Well located in Farmington, approximately 2.79 miles northwest of the property which serves an estimated 406 persons [21; 23; 31].

The NBWD supplies water to some residents of New Britain, as well as Farmington, Kensington, Newington and Plainville. The supply is provided from six reservoirs which are not located downstream of the FIP properties [18, p. 51; 39].

Most of Plainville is provided drinking water by the PWC and the NBWD. The Cope Manor Rest Home maintains a bedrock well which provides drinking water to an estimated 92 patients and staff and is located approximately 1.52 miles southwest of the property [19; 34]. Ciccio Court Apartments, located approximately 3.31 miles south of the property, also maintains a well in Plainville serving an estimated 80 people [18, p. 35; 19].

Parts of Southington lie within four radial miles of the NEAP property, but there are no Southington public water supplies that are located within the four radial miles of the NEAP property. One community water supply is located approximately 3.71 miles south of the property at Apple Valley Village Apartments, serving an estimated 70 people [18, p. 50; 19; 26]. Table 6 summarizes public groundwater supply sources located within four radial miles of the NEAP property [18, pp. 35, 36, 50, 51; 19; 21; 35; 36; 37; 38].

Table 6

Public Groundwater Supply Sources within Four Radial Miles of New England Aircraft Plant #1

Distance/ Direction from Site	Source Name	Location of Source	Estimated Population Served	Source Type
0.28 miles Northwest	UWC Wells Acres	Farmington	457	1 bedrock well
0.39 miles Southeast	UWC FIP Well No. 4	Plainville	477	1 overburden well
0.42 miles Southeast	UWC FIP Well No. 3	Plainville	547	1 overburden well
0.42 miles Southeast	UWC FIP Well No. 1	Farmington	2	1 overburden well
0.47 miles Southeast	UWC FIP Well No. 2	Farmington	0	1 overburden well
0.47 miles Southeast	PWC Johnson Ave. Well No. 6	Plainville	2,740	1 overburden well
0.49 miles Southeast	PWC Johnson Ave. Well No. 3	Plainville	2,740	1 overburden well
1.52 miles Southwest	Cope Manor	Plainville	92	1 bedrock well
2.22 miles West	NBWD White Bridge Wells	Bristol	25,900	2 overburden wells
2.32 miles Southeast	PWC Woodford Avenue Wells	Plainville	14,520	3 overburden wells
2.42 miles Southwest	BWD Well No. 2	Bristol	10,000	1 overburden well
2.71 miles Northwest	Farmington Line West Condominium	Burlington	34	Unknown
2.78 miles Northeast	UWC CT Sand & Stone Well	Farmington	2,792	1 overburden well
2.79 miles Northwest	UWC Pondwood Well	Farmington	406	1 bedrock well
2.81 miles West	BWD Mix Street Wells	Bristol	10,000	3 overburden wells
2.81 miles Northwest	Woodcrest Association	Burlington	60	Unknown
3.31 miles South	Ciccio Court	Plainville	80	Unknown
3.71 miles South	Apple Valley Village	Southington	70	Unknown

The nearest verified private well to the property is located approximately 1.1 miles northwest of the NEAP property [53, pp. 9-10]. The number of persons who rely on private groundwater supplies within a four-mile radius of the FIP was reported by CENTRACTS which estimates groundwater populations using equal distribution calculations of U.S. Census data identifying population, households and private water wells for "Block Groups" which lie wholly or in part within individual radial distance rings measured from potential sources on the NEAP property [11]. Because the CENTRACTS report estimates private well use in each block and no private wells have been identified less than 1.1 miles from the property, the population attributed to the 0 to 0.25, the 0.25 to 0.5, and the 0.5 to 1.0, mile rings in the CENTRACTS report has been shifted to the 1.0 to 2.0-mile distance ring. Table 7 summarizes public and private well users within four miles of the NEAP property [18, pp. 35, 36, 50, 51; 21; 53].

Table 7

Estimated Drinking Water Populations Served by Groundwater Sources within Four Radial Miles of New England Aircraft Plant #1

Radial Distance from NEAP (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources within the Ring
0.00 < 0.25	0	0	0
0.25 < 0.50	0	6,963	6,963
0.50 < 1.00	0	0	0
1.00 < 2.00	1,382	92	1,474
2.00 < 3.00	2,809	63,712	66,521
3.00 < 4.00	3,692	150	3,842
TOTAL	**7,883**	**70,917**	**78,800**

According to state file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that Johnson Avenue Well No. 6 was first sampled in June 1982.

Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 ppb. The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-TCA at 1,000 ppb, chloroform at 680 ppb, PCE at 640 ppb, and TCE at 430 ppb. The highest concentrations of 1,1,1-TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

Samples have been collected from the six affected wells intermittently from 1975 to the present, with the exception of Johnson Avenue Well No. 6, for which no analytical results are available prior to 1982 [33, p. 6]. A summary of these analytical results, through 1989, is included in Attachment C. The concentration of chlorinated organics in the wells has generally decreased since their discovery in 1975, but were still present as of the latest sampling round conducted in Spring 1995 [26; 27; 33, Attachment B]. The most recent analytical results available for the FIP wells and the Johnson Avenue wells are included in Attachment D. Table 8 summarizes the historical results of sampling of the FIP and Johnson Avenue wells [1; 24; 25; 49; 67]. The first data column notes the highest concentration of the substance and the sampling date. The second data column records the concentration of the same substance as detected in the most recent sampling event, excluding groundwater sampling conducted as part of this SIP, in order to illustrate the trend of contamination.

Table 8

Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park

Well	Substance	Highest Concentration/Date (ppb)	Most Recent Concentration/Date (ppb)	EPA MCL (ppb)
FIP No. 1	Chloroform	20 6/2/75	NS	---
	1,1,1-TCA	ND	NS	200
	TCE	200 6/2/75	NS	5
	PCE	ND	NS	5
FIP No. 2	Chloroform	60 6/2/75	NS	---
	1,1,1-TCA	ND	NS	200
	TCE	85 6/2/75	NS	5
	PCE	160 6/2/75	NS	5
FIP No. 3	Chloroform	97 6/2/75	ND 1/11/95	---
	1,1,1-TCA	46 * 3/20/80	4.1 1/11/95	200
	TCE	36 6/2/75	0.86 1/11/95	5
	PCE	73 6/2/75	1.2 1/11/95	5
FIP No. 4	Chloroform	77 6/2/75	ND 10/28/94	---
	1,1,1-TCA	25 * 2/29/80	4.9 10/28/94	200
	TCE	53 6/2/75	0.95 10/28/94	5
	PCE	640 6/2/75	1.5 10/28/94	5
Johnson Avenue Well No. 3	Chloroform	680 6/2/75	ND 1/17/95	---
	1,1,1-TCA	1,000 6/20/75	19.7 1/17/95	200
	TCE	900 7/22/75	4.9 1/17/95	5
	PCE	60 6/2/75	14.0 1/17/95	5

Table 8

Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park (concluded)

Well	Substance	Highest Concentration/Date (ppb)	Most Recent Concentration/Date (ppb)	EPA MCL (ppb)
Johnson Avenue Well No. 6	Chloroform	ND	ND 1/17/95	---
	1,1,1-TCA	12.8 4/19/88	3.5 1/17/95	200
	TCE	34.8 9/6/88	21.0 1/17/95	5
	PCE	5.8 12/22/86	3.1 1/17/95	5

ND = Not Detected.
NS = Not Sampled.
* = A higher concentration of 1,1,1-TCA, 101 ppb, was detected in a composite sample of water from FIP Well Nos. 3 and 4 on October 3, 1983.
EPA MCL = EPA Maximum Contaminant Level.

From 1992 through 1994, HRP conducted four environmental investigations at the NEAP property to evaluate on-site sources of contamination. During this two year period, a total of 14 groundwater monitoring wells were installed on the property. Groundwater samples have been collected from the on-site monitoring wells to evaluate groundwater conditions beneath the property. Abbreviated summaries of HRP investigations follow.

In April 1992, HRP installed eight groundwater monitoring wells at the NEAP property including one upgradient monitoring well (MW-1) to evaluate local groundwater quality (Figure 2). In July 1993, HRP installed an additional six groundwater monitoring wells at the NEAP property to address concerns presented by the CT DEP. The six monitoring wells were installed in the east portion of the property (Figure 2). Table 9 lists the groundwater monitoring wells installed by HRP on the NEAP property, and their respective locations.

Table 9

Groundwater Monitoring Well Locations at New England Aircraft Plant #1, Installed by HRP Associates, Inc. in 1992 and 1993

Monitoring Well I.D.	Location
MW-1*	Installed in the northwest corner of the property, as the background reference well.
MW-2*	Installed in the vicinity of Leachfield No. 2.
MW-3*	Installed in the vicinity of Leachfield No. 1.

Table 9

Groundwater Monitoring Well Locations at New England Aircraft Plant #1, Installed by HRP Associates, Inc. in 1992 and 1993 (concluded)

Monitoring Well I.D.	Location
MW-4*	Installed along the eastern property boundary, in the vicinity of the former metal hydroxide sludge disposal area.
MW-5*	Installed in the loading dock area, where 55-gallon drums are stored.
MW-6*	Installed in the east parking lot, in the vicinity of the former metal hydroxide sludge disposal area.
MW-6A	Installed approximately twelve feet south of MW-6.
MW-7*	Installed in the vicinity of the former 1,000-gallon No. 2 fuel oil UST located west of the manufacturing building.
MW-8*	Installed in the vicinity of the abandoned 2,500-gallon No. 2 fuel oil UST located southeast of the manufacturing building.
MW-9	Installed along the southern border of the eastern parking lot, approximately 56 feet south of MW-6A.
MW-10	Installed in the vicinity of the southeast drainage ditch, to evaluate the presence of nickel in soils and groundwater.
MW-11	Installed along the central-east portion of the eastern parking lot, in the vicinity of the former disposal area.
MW-12	Installed in the vicinity of the northeast drainage ditch, to evaluate the presence of nickel in soils and groundwater.
MW-13	Installed in the vicinity of the above ground waste oil tank area, along the east wall of the manufacturing building.

* = Installed in May 1992. All other wells installed in August 1993.

In 1992, the CT DEP requested that HRP conduct two rounds of groundwater sampling at the NEAP property. HRP collected groundwater samples at the NEAP property on May 4 and June 3, 1992. Groundwater samples collected by HRP were reportedly submitted to a State-certified laboratory for VOC analyses using EPA Methods 8010 , 8015, and 8020; and metals analyses for barium, cadmium, chromium, lead, mercury, nickel, copper, zinc, cyanide, and sodium chloride. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (MW-1). However, if the compound or element is not detected in the reference sample, the minimum detectable level (MDL) as reported by HRP is used as the reference value. These compounds or elements are discussed if they occurred at a value equal to or greater than the reference sample's MDL and are designated by their approximate relative concentration above these values.

The May 4, 1992 HRP groundwater sampling event indicated that monitoring well MW-6, installed in the vicinity of documented ECM metal hydroxide releases, detected the highest

concentrations of VOCs, with 1,1,1-TCA at 3.0 ppb, three times the MDL; 1,1-dichloroethane (1,1-DCA) at 3.0 ppb, three times the MDL; and PCE at 4.0 ppb, four times the MDL. Monitoring well MW-6 detected the highest concentrations of inorganic elements, with barium at 0.51 ppm, 1.02 times the MDL; chromium at 0.55 ppm, 11 times the MDL; nickel at 0.06 ppm, 1.2 times the MDL; sodium at 3,480 ppm, 348 times the reference sample concentration; chloride at 5,000 ppm, 156 times the reference sample concentration; and total dissolved solids at 9,393 ppm, 46 times the reference sample concentration. None of the contaminants detected during this sampling event exceeded EPA MCLs. Analytical results from other monitoring wells on the property reported similar substances with generally lower concentrations. The June 3, 1992 HRP sampling event revealed consistent results with those of the May 4, 1992 sampling event.

In September 1993, HRP collected additional groundwater samples from the on-site monitoring wells. The results of the groundwater sampling indicated that sodium levels ranged from 162 to 584 mg/L and chloride levels ranged from 1,400 to 3,800 mg/L. The sampling also indicated that the following halogenated organics were detected (highest concentrations are indicated): 1,1-dichloroethylene (1,1-DCE) at 28.0 ppb; 1,1-DCA at 15.0 ppb; 1,1,1-TCA at 54.0 ppb; TCE at 2.0 ppb; and PCE at 10.0 ppb. No reference sample values were reported as part of the September 1993 HRP sampling event.

A May 1994 HRP groundwater sampling event indicates that the levels of sodium had increased to 2,720 mg/L and chloride increased to 4,400 mg/L. In addition, halogenated hydrocarbons detected included 1,1-DCE (62.0 ppb), 1,1-DCA (14.0 ppb), 1,1,1-TCA (101.0 ppb), TCE (3.0 ppb), and PCE (7.0 ppb). The highest concentrations reported were detected in monitoring well MW-6A. Two of the detected halogenated VOCs exceeded the EPA MCLs: 1,1-DCE (MCL is 7 ppb) and PCE (MCL is 5 ppb). No aromatic hydrocarbons were detected in any of the groundwater samples submitted for analysis. No reference sample values were reported as part of the May 1994 HRP sampling event.

HRP reported that no spills of solvents were known to have occurred at the NEAP property. In addition, solvents were reportedly never stored outside and, of the substances detected, only 1,1,1-TCA has been used on-site. HRP concluded that the source of the halogenated solvents detected in on-site groundwater samples, was likely associated with an off-site source. HRP also reported that the detected inorganic constituents and total dissolved solids in on-site monitoring wells may be due to prior documented spills of ECM metal hydroxide sludge in the eastern parking lot. HRP explained that the ECM machining process utilizes a sodium chloride electrolyte solution to remove material from the part being machined; consequently, the constituents of this solution have been detected in the monitoring wells. The complete analytical results of HRP sampling events are included in Attachment B.

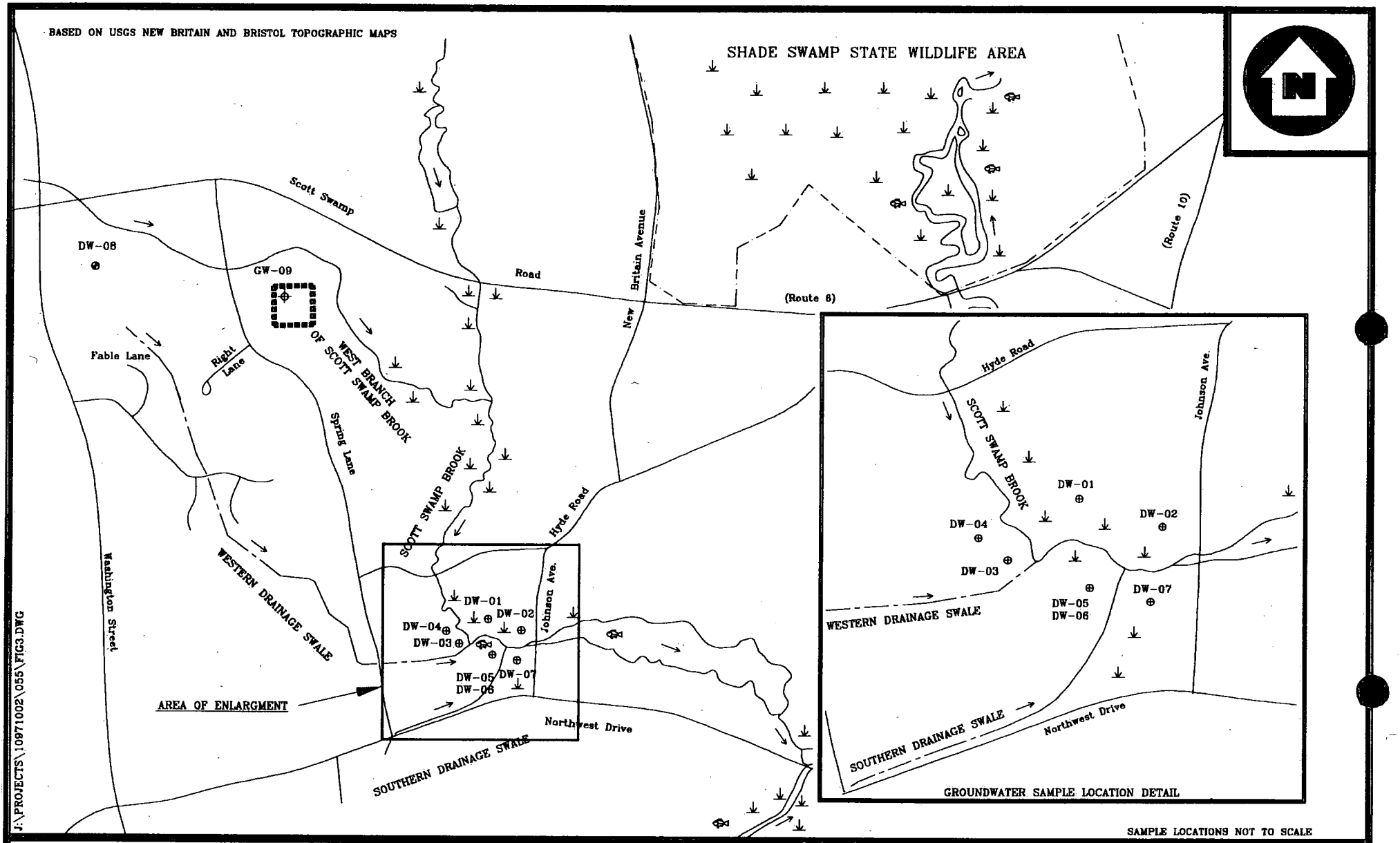
On July 12, 1995, WESTON collected eleven groundwater and drinking water samples from one monitoring well and eight public supply wells in the vicinity of the FIP, including a reference groundwater sample (GW-09), replicate and duplicate samples (GW-03/04), a rinsate blank sample (RB-02), and a trip blank sample (TB-01) (Figure 3). Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory [53, pp. 39-40].

Table 10 summarizes groundwater and drinking water samples collected during the WESTON FIP sampling event, and Figure 3 depicts the groundwater and drinking water sample locations [53, pp. 39-40].

Table 10

Groundwater and Drinking Water Sample Summary: New England Aircraft Plant #1, Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
DW-01	DAR73 AHF21 MAGL38	1015	Grab	Drinking water sample collected from FIP Well No. 1.
DW-02	DAR74 AHF22 MAGL39	1115	Grab	Drinking water sample collected from FIP Well No. 2.
DW-03	DAR75 AHF23 MAGL40	0945	Grab	Drinking water sample collected from FIP Well No. 3.
DW-04	DAR76 AHF24 MAGL41	1005	Grab	Drinking water sample collected from FIP Well No. 4.
DW-05	DAR77 AHF25 MAGL42	1400	Grab	Drinking water sample collected from Johnson Avenue Well No. 6.
DW-06	DAR78 AHF26 MAGL43	1400	Grab	Duplicate of sample DW-05 collected for quality control.
DW-07	DAR79 AHF27 MAGL44	1415	Grab	Drinking water sample collected from Johnson Avenue Well No. 3.
DW-08	DAR80 AHF28 MAGL45	0915	Grab	Drinking water sample collected from the UWC Wells Acres Well.
GW-09	DAR81 AHF29 MAGL46	1255	Grab	Groundwater sample collected from monitoring well MW-01 on the New England Aircraft Plant No. 1 property, as a reference sample.
TB-02	DAR83	0855	Grab	Trip Blank sample collected for quality control.
RB-02	DAR82 AHF33 MAGL50	0900	Grab	Rinsate Blank sample collected for quality control.



LEGEND

- DRINKING WATER WELL (OVERBURDEN)
- DRINKING WATER WELL (BEDROCK)
- MONITORING WELL (OVERBURDEN)
- FISHERY
- STATE WILDLIFE AREA PROPERTY LINE
- WETLAND
- MANMADE STREAM/SWALE
- STREAM/RIVER
- NEW ENGLAND AIRCRAFT PLANT #1

GROUNDWATER SAMPLE LOCATION MAP

NEW ENGLAND AIRCRAFT
PLANT #1
FARMINGTON INDUSTRIAL
PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3

Table 11 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON drinking water samples collected on July 12, 1995 [34; 41; 51; 53]. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (GW-09). However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 11

Summary of Analytical Results,
Drinking Water Sample Analysis for New England Aircraft Plant #1:
Samples Collected by WESTON on July 12, 1995

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-01 DAR73 AHF21 MAGL38	**VOCS**			
	1,1,1-TCA	31 µg/L	2 U µg/L	15.50 × SQL
	TCE	4.2 µg/L	2 U µg/L	2.10 × SQL
	SVOCS			
	Naphthalene	2.4 µg/L	2 U µg/L	1.20 × SQL
DW-02 DAR74 AHF22 MAGL39	**VOCS**			
	1,1-DCE	2.1 µg/L	2 U µg/L	1.05 × SQL
	1,1,1-TCA	16 µg/L	2 U µg/L	8.00 × SQL
	TCE	4.9 µg/L	2 U µg/L	2.45 × SQL
	cis-1,2-DCE	6.6 µg/L	2 U µg/L	3.30 × SQL
	PCE	25 µg/L *	2 U µg/L	12.50 × SQL
DW-03 DAR75 AHF23 MAGL40	**VOCS**			
	1,1,1-TCA	4.9 µg/L	2 U µg/L	2.45 × SQL
DW-04 DAR76 AHF24 MAGL41	**VOCS**			
	cis-1,2-DCE	10 µg/L	2 U µg/L	5.00 × SQL
	PCE	2.7 µg/L	2 U µg/L	1.35 × SQL
DW-05 DAR77 AHF25 MAGL42	**VOCS**			
	TCE	13 µg/L *	2 U µg/L	6.50 × SQL
	cis-1,2-DCE	5.6 µg/L	2 U µg/L	2.80 × SQL
	1,2,3-Trichlorobenzene	2 µg/L	2 U µg/L	1.00 × SQL

Table 11

Summary of Analytical Results,
Drinking Water Sample Analysis for New England Aircraft Plant #1:
Samples Collected by WESTON on July 12, 1995
(concluded)

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-05 (concluded)	**SVOCS**			
	Naphthalene	4.3 µg/L	2 U µg/L	2.15 × SQL
DW-06 DAR78 AHF26 MAGL43	**VOCS**			
	TCE	13 µg/L *	2 U µg/L	6.50 × SQL
	cis-1,2-DCE	5.6 µg/L	2 U µg/L	2.80 × SQL
DW-07 DAR79 AHF27 MAGL44	**VOCS**			
	1,1,1-TCA	10 µg/L	2 U µg/L	5.00 × SQL
	TCE	2.7 µg/L	2 U µg/L	1.35 × SQL
	cis-1,2-DCE	2.3 µg/L	2 U µg/L	1.15 × SQL
	PCE	7.4 µg/L *	2 U µg/L	3.70 × SQL

U = The compound was analyzed for; but, was not detected. The associated numerical value is the sample quantitation limit.
* = Concentration exceeds the MCL.
cis-1,2-DCE = cis-1,2-Dichloroethylene.

Groundwater sample GW-09 was selected as a reference sample because it was collected from monitoring well MW-1 on the NEAP property, which is located upgradient of potential sources of groundwater contamination identified within the vicinity of the FIP, including the NEAP property [53]. None of the groundwater or drinking water samples collected by WESTON were filtered prior to collection.

Several VOCs were detected at elevated concentrations in drinking water samples submitted for analysis; sample concentrations ranged from 1.0 to 15.5 times the SQL. The following VOCs were detected at concentrations that exceed current MCLs; PCE at 25 and 7.4 µg/L in DW-02 and DW-07, respectively and TCE at 13 µg/L in DW-05 and DW-06. The EPA MCL for PCE is 5 µg/L. The concentrations of PCE detected in drinking water samples DW-02 and DW-07 are 5.0 and 1.5 times the MCL, respectively. The MCL for TCE is 5 µg/L. The concentration of TCE detected in drinking water samples DW-05 and DW-06 is 2.6 times the MCL in both samples.

The SVOC naphthalene was also detected between 1.2 and 2.15 times the SQL. Naphthalene is a component of petroleum fractions and may be considered a constituent of waste oils, cutting

oils, and lubricating oils. No pesticide/PCB or inorganic elements were detected in any of the WESTON drinking water samples collected to evaluate the property. The complete analytical results of the 1995 WESTON sampling event are included in Attachment E.

Comparisons can be drawn between historical drinking water analytical results and the more recent analytical results to determine potential trends of contamination. The following is a description of analytical concentrations for certain contaminants detected in the FIP and Johnson Avenue Wells, including the date of a contaminant's highest concentration in a particular well and current status of the well with respect to the contaminant.

Chloroform

The highest concentration of chloroform in FIP Well No. 1 was detected at 20 µg/L on June 2, 1975. Analytical results from the WESTON sampling event, conducted on July 12, 1995, indicated that chloroform was not present above the detection limits in this well [1; 24; 25; 51]. The highest concentration of chloroform in FIP Well No. 3 was detected at 97 µg/L on June 2, 1975. Analytical results from January 11, 1995, indicate that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicated a non-detectable value of chloroform in FIP Well No. 3.

The highest concentration of chloroform in FIP Well No. 4 was detected at 77 µg/L on June 2, 1975. Analytical results from October 28, 1994, indicated that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicate a non-detectable value of chloroform in FIP Well No. 4.

The highest concentration of chloroform in Johnson Avenue Well No. 3 was detected at 680 µg/L on June 2, 1975. Analytical results from January 17, 1995, indicate that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event, on July 12, 1995, also indicate a non-detectable value of chloroform in Johnson Avenue Well No 3. Chloroform has never been detected above detection limits in Johnson Avenue Well No. 6 [1; 24; 25; 51].

Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue wells. Based on operational records provided by NEAP and prior analytical data from on-site samples collected by CT DEP, National Oil, NUS/FIT, and HRP; chloroform is not considered attributable to the NEAP property for the purposes of this SIP.

1,1,1-Trichloroethane

Prior to the WESTON sampling event on July 12, 1995, 1,1,1-TCA had never been detected in FIP Well Nos. 1 or 2. However, analytical results from the WESTON sampling event indicated that 1,1,1-TCA is present in FIP Well No. 1 at 31 µg/L and FIP Well No. 2 at 16 µg/L.

The highest concentration of 1,1,1-TCA in FIP Well No. 3 was detected at 46 µg/L on March 20, 1980. On January 11, 1995, the concentration of 1,1,1-TCA had diminished to

4.1 µg/L. The WESTON sampling event revealed that the 1,1,1-TCA concentration has slightly increased from January 11, 1995, to 4.9 µg/L in FIP Well No. 3.

The highest concentration of 1,1,1-TCA in FIP Well No. 4 was detected at 25 µg/L on February 29, 1980. On October 28, 1994, the concentration of 1,1,1-TCA had decreased to 4.9 µg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in FIP Well No. 4.

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 3 was detected at 1,000 µg/L on June 20, 1975. This concentration exceeds the MCL for 1,1,1-TCA (established at 200 µg/L) five times. A January 17, 1995 sampling event indicated that this concentration had decreased to 19.7 µg/L, substantially below the MCL. A 1,1,1-TCA concentration of 10 µg/L was detected in Johnson Avenue Well No. 3 by WESTON during the July 12, 1995 sampling event.

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 6 was detected at 12.8 µg/L on April 19, 1988. A January 17, 1995 sampling event indicated that this concentration had decreased to 3.5 µg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in Johnson Avenue Well No. 6 [1; 24; 25; 51].

Based on the analytical results, it appears that the presence of 1,1,1-TCA in FIP Wells No. 1 and 2 may be the result of an accumulation of the contaminant in the overburden material, despite a 15-minute purge prior to sample collection. These two wells are used for back-up purposes and, at the time of sample collection on July 12, 1995, had not been pumping for several weeks [1; 24; 25; 51; 53]. The concentrations of 1,1,1-TCA in the remaining wells have illustrated steady declines over time, with the exception of FIP Well No. 3, which displayed a slightly elevated concentration.

Based on operational records provided by NEAP and information from the NUS/FIT SSI; the detected concentrations of 1,1,1-TCA may be considered attributable to the NEAP property since this compound has been reportedly used during on-site operations at the manufacturing building between 1961 and 1990 [1; 24; 25; 51]. 1,1,1-TCA was detected in a waste oil sample collected by National Oil in May 1988, and 1,1,1-TCA has been detected in on-site soil and groundwater samples. 1,1,1-TCA may degrade in soils and groundwater to 1,1-DCE, 1,1-DCA, cis-1,2-DCE, chloroethane, vinyl chloride, and acetic acid [65; 66]. The degradation of 1,1,1-TCA to cis-1,2-DCE and 1,1-DCE may explain the presence of the concentrations of these substances in several FIP drinking water wells which were sampled.

Trichloroethylene

The highest concentration of TCE in FIP Well No. 1 was detected at 200 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE (established at 5 µg/L) by 40 times. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 1 has diminished to 4.2 µg/L [1; 24; 24; 51]. The highest concentration of TCE in FIP Well No. 2 was detected at 85 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE by 17 times. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 2 has diminished to 4.9 µg/L [1; 24; 25; 51].

The highest concentration of TCE in FIP Well No. 3 was detected at 36 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than seven times. On January 11, 1995, the concentration of TCE was detected at 0.86 µg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 3 has further diminished to below detectable levels [1; 24; 25; 51].

The highest concentration of TCE in FIP Well No. 4 was detected at 53 µg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than ten times. On October 28, 1994, the concentration of TCE was detected at 0.95 µg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 4 has further diminished to below detectable levels [1; 24; 25; 51].

The highest concentration of TCE in Johnson Avenue Well No. 3 was detected at 900 µg/L on July 22, 1975. This concentration exceeds the MCL for TCE by 180 times. On January 17, 1995 the concentration of TCE was detected at 4.9 µg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in Johnson Avenue Well No. 3 has further diminished to 2.7 µg/L [1; 24; 25; 51].

The highest concentration of TCE in Johnson Avenue Well No. 6 was detected at 34.8 µg/L on September 6, 1988. This concentration exceeds the MCL for TCE by nearly seven times. On January 17, 1995, the concentration of TCE was detected at 21.0 µg/L in this well. Analytical results from the WESTON sampling event indicated that the concentration of TCE in Johnson Avenue Well No. 6 has further diminished to 13 µg/L. Despite the steady decline of TCE in this well, the current concentration exceeds the MCL by more than two times [1; 24; 25; 51].

The concentrations of TCE in the FIP and Johnson Avenue Wells have consistently displayed steady declines over time. Concentrations which were significantly above the MCL, have diminished to below the MCL, with the exception of Johnson Avenue Well No. 6, which still exceeds the MCL greater than two times. For the purpose of this SIP, the detected concentrations of TCE may be considered attributable to the NEAP property, since this substance has been detected in a waste oil sample collected by National Oil in May 1988 [1, p. 2]. In addition, TCE has been detected in on-site groundwater monitoring wells. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride [65; 66].

Tetrachloroethylene

PCE has not been previously detected in FIP Well No 1. The highest concentration of PCE in FIP Well No. 2 was detected at 160 µg/L on June 2, 1975. This concentration exceeds the MCL for PCE (established at 5 µg/L) by 32 times. The WESTON sampling event revealed that PCE has decreased to 25 µg/L in this well. This concentration still exceeds the MCL by five times [1; 24; 25; 51].

The highest concentration of PCE in FIP Well No. 3 was detected at 73 µg/L on June 2, 1975. On January 11, 1995, the concentration of PCE in this well had dropped to 1.2 µg/L. The WESTON sampling event indicated that PCE was not detected above detection limits in FIP Well No. 3 [1; 24; 25; 51].

The highest concentration of PCE in FIP Well No. 4 was detected at 640 µg/L on June 2, 1975, at 128 times the MCL. As of October 28, 1994, the concentration had dropped to 1.5 µg/L. The July 12, 1995 WESTON sampling event revealed that the concentration of PCE had raised slightly to 2.7 µg/L. Despite the increase, the concentration remains below the MCL [1; 24; 25].

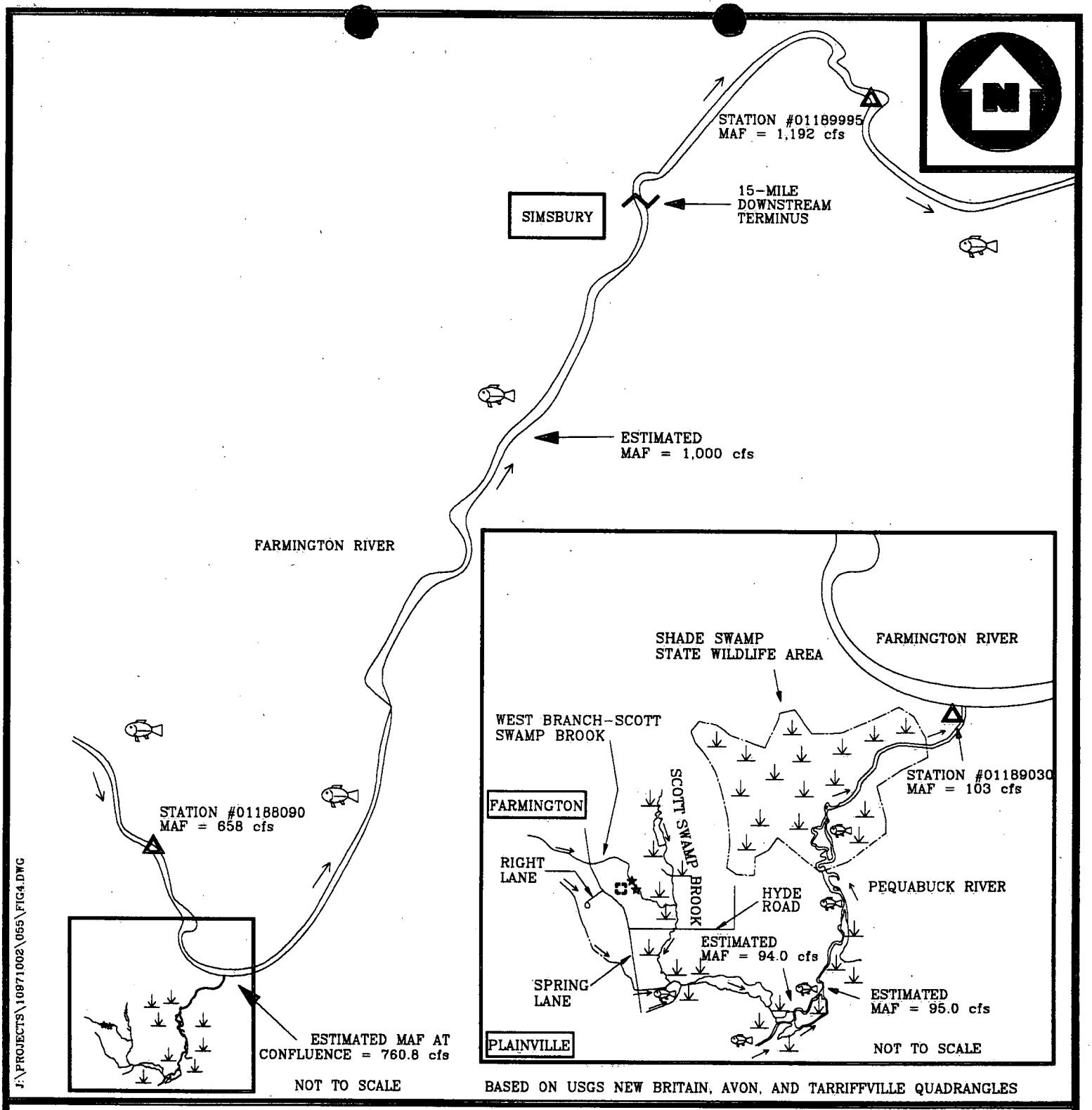
The highest concentration of PCE in Johnson Avenue Well No. 3 was detected at 60 µg/L on June 2, 1975, at twelve times the MCL. As of January 17, 1995, this concentration had decreased to 14.0 µg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 3 was still above the MCL, at 7.4 µg/L [1; 24; 25; 51]. The highest concentration of PCE in Johnson Avenue Well No. 6 was detected at 5.8 µg/L on December 22, 1986, slightly above the MCL. As of January 17, 1995, this concentration had decreased to 3.1 µg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 6 had decreased to below detection limits [1; 24; 25; 51].

In general, PCE concentrations have steadily declined over the years in the FIP and Johnson Avenue Wells; however, two of the drinking water wells, FIP Well No. 2 and Johnson Avenue Well No. 3, still contain concentrations of PCE above the MCL. For the purpose of this SIP, the detected concentrations of PCE may be considered attributable to the NEAP property, since this substance has been detected in a waste oil sample collected by National Oil in May 1988 [1, p. 2]. PCE has also been detected in an HRP sediment sample, at a concentration of 14 ppb. The sample was collected from the West Branch of Scott Swamp Brook, at the location where the drainage ditch on the southeast corner of the property enters the brook. In addition, PCE has been detected by HRP in on-site monitoring wells located in the vicinity of the metal hydroxide disposal area. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride [65; 66].

SURFACE WATER PATHWAY

The NEAP property slopes gradually from the west to the east [4]. Overland flow from the NEAP property travels east and is collected at one of two on-site drainage ditches. One drainage ditch is located at the southeast corner of the property and the other is located at the northeast corner of the property, herein referred to as PPE^1 and PPE^2, respectively. Both ditches lead sharply down to the West Branch of Scott Swamp Brook. The PPEs of overland flow to the West Branch of Scott Swamp Brook are the points at which the drainage ditches discharge into the West Branch of Scott Swamp Brook (Figure 4). The total overland flow distance is approximately 500 feet [3; 4]. Both of the drainage ditch areas have been recently excavated to remove sediment that may have contained elevated concentrations of inorganics.

The West Branch of Scott Swamp Brook travels southeast approximately 0.5 miles to discharge into Scott Swamp Brook which then travels approximately 1.4 miles southeast to discharge to the Pequabuck River, which travels approximately 2.32 miles north through the Shade Swamp State Wildlife Area and ultimately discharges to the Farmington River. The 15-mile downstream point



SURFACE WATER MIGRATION ROUTE

NEW ENGLAND AIRCRAFT PLANT #1
FARMINGTON, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 4

from the NEAP property is located in the vicinity of the Route 315 bridge crossing the Farmington River in Simsbury, Connecticut (Figure 4) [68]. Table 12 summarizes the characteristics of the water bodies within 15-downstream miles of the NEAP property [35; 36; 37; 38; 47; 52; 68].

Table 12

Water Bodies Along the 15-Mile Downstream Pathway from New England Aircraft Plant #1

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
West Branch of Scott Swamp Brook	Minimal stream	0.5	< 7.2	0.0
Scott Swamp Brook	Minimal stream	1.4	< 7.2	0.2
Pequabuck River	Small to moderate stream	1.54	94.0 to 100	1.2
Pequabuck River	Moderate to large stream	0.78	100 to 103	1.2
Farmington River	Moderate to large stream	9.23	761 to 1,000	0.1
Farmington River	Large stream to river	1.55	1,000 to 1,080	-

[a] = Minimal stream. Small to moderate steam. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

[b] = Flow rates are reported in cubic feet per second and were estimated using available U.S. Geological Survey gaging station information and from observations and field measurements made by WESTON.

No known drinking water intakes are located within 15 downstream miles of the NEAP property [18, p. 51; 42; 47]. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered recreational fisheries, although neither water body is stocked (Figure 4) [18, p. 14-15; 42; 69]. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the NEAP property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river [69]. None of the fisheries downstream of the NEAP property have been closed.

A number of endangered/threatened species have been identified within four radial miles of the NEAP property, but available information does not indicate whether these environments are located along the downstream surface water drainage route from the property [63; 64]. However, the Shade Swamp State Wildlife Area, located along the Pequabuck River approximately 1.5 to 2.3 miles downstream from the NEAP property, is noted by the CT DEP as containing sensitive environments (Figure 4) [63; 64]. Table 13 summarizes sensitive environments located within 15 downstream miles of the NEAP property [52; 63; 64].

Table 13

Sensitive Environments Located Along the 15-Mile Downstream Pathway from New England Aircraft Plant #1

Sensitive Environment Name	Sensitive Environment Type	Water Body	Downstream Distance from PPE	Flow Rate at Environment
West Branch of Scott Swamp Brook	Protected under Clean Water Act	West Branch of Scott Swamp Brook	0.0 miles	<4 cfs
Shade Swamp State Wildlife Area	State Wildlife Management Area	Pequabuck River	1.5 miles	96 cfs
Sandplain Gerardia (*Agalinis acuta*)	State-endangered species	Pequabuck River	1.5 miles	96 cfs
New England Grape (*Vitis novae-angliae*)	State species of Special Concern	Pequabuck River	1.5 miles	96 cfs

On July 10, 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the NEAP property as part of the SSI [1]. NUS/FIT collected two sediment samples from the West Branch of Scott Swamp Brook to evaluate the potential migration of hazardous substances from the NEAP property (Figure 2) [1, Table 3]. Samples were submitted through the EPA CLP for target compound list organics and target analyte list elements [1, p. 7]. Pesticide/PCB analyses were not performed. Table 14 summarizes NUS/FIT sediment samples collected to evaluate the NEAP property [1, p. 7, Table 3].

Table 14

Sediment Sample Summary: New England Aircraft Plant #1, Samples Collected by NUS/FIT on July 10, 1989

Sample Location No.	Traffic Report No.	Remarks	Sample Source
MATRIX: SEDIMENT			
SD-01	AQ008 MAL735	Grab (0.2 feet)	Sediment sample collected from the West Branch of Scott Swamp Brook, approximately 90 feet downstream of where the southeast drainage ditch discharges to PPE[1].
SD-02	AQ009 MAL736	Grab (0.2 feet)	Sediment sample collected from the West Branch of Scott Swamp Brook, approximately 10 feet upstream of where the northeast drainage ditch discharges to PPE[2]. This sediment sample was collected to document reference concentrations.

Table 15 is a summary of organic compounds and inorganic elements detected through CLP analyses of NUS/FIT sediment samples [1, pp. 7-8]. For each sample location, a compound or element is listed if it is detected at three times or greater than the reference sample concentration (SD-02). However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 15

Summary of Analytical Results,
Sediment Sample Analysis for New England Aircraft Plant #1:
Samples Collected by NUS/FIT on July 10, 1989

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-01 (AQ008) (MAL735)	**VOCS**			
	Tetrachloroethylene	14 µg/kg	6 U µg/kg	2.3 × SQL
	INORGANICS			
	Copper	88.7 mg/kg	9.5 mg/kg	9.3 × REF
	Nickel	46.8 mg/kg	11.3 mg/kg	4.1 × REF

U = The compound was analyzed for but not detected.
REF = Reference sample.

Analyses of the NUS/FIT sediment samples detected the presence of one VOC and two inorganic elements. Sediment sample, SD-01 detected PCE at 14 µg/kg, copper at 88.7 mg/kg, and nickel at 46.8 mg/kg. The presence of PCE in the NUS/FIT sediment sample is consistent with the detection of PCE in an on-site source sample collected by National Oil in May 1988 and from HRP groundwater samples. Similarly, the inorganic elements detected in the sediment sample were determined to be present in the metal hydroxide sludge by an EP Toxicity test. NUS/FIT reported that the detected inorganic elements may be attributable to the past documented dumping of metal hydroxide sludge onto the eastern parking lot at the NEAP property. The complete analytical results of the 1989 NUS/FIT SSI sampling event are included in Attachment A.

In July 1993, HRP collected seven surface water samples from the West Branch of Scott Swamp Brook to assess whether sodium and chloride detected in on-site groundwater samples were impacting the nearby surface water body. Samples were submitted for analysis of chloride and sodium. Results of the surface water sampling indicated that sodium and chloride were detected at 14.6 and 28 mg/L from the upstream surface water sample location. The concentration of sodium and chloride steadily increased in samples collected further downstream. The highest values were detected at the furthest downstream sampling location, with sodium at 30.2 mg/L and

chloride at 52.0 mg/L; however, these concentrations were less than three times the reference values [5]. The detection of sodium and chloride in HRP surface water samples is consistent with past practices of dumping metal hydroxide sludge onto the east parking lot prior to off-site removal.

FIP Evaluation

The FIP properties for which WESTON is performing SIPs are a mixture of laboratories, metalworking, and machine shops. Processes which are common within the FIP and vicinity include laboratory work, metal working (cutting, milling, drilling, lathing, and grinding), degreasing, painting, metal plating, and machinery assembly. Various FIP properties being investigated by WESTON have, at one time, used chlorinated solvents in processes at their facilities, primarily for the purpose of metal degreasing prior to finishing. Prior to circa 1980, public sewer service was not available in the FIP; sanitary waste in the FIP was discharged to on-site septic systems, drywells, or some combination of these systems. Wastewaters generated from on-site processes, often containing solvents, chlorinated solvents, or inorganic elements, were often discharged to these same on-site disposal systems. Several properties disposed larger amounts of wastewater or non-contact cooling water directly to Scott Swamp Brook, its tributaries, or drainage systems which lead to Scott Swamp Brook.

After 1980, several FIP properties filed with EPA Region I under the requirements of RCRA as generators of hazardous waste. Under the RCRA program, CT DEP inspected these facilities every few years to verify compliance with hazardous waste disposal regulations. In general, on-site disposal of hazardous wastes ceased throughout the FIP between 1980 and 1983, when public sanitary sewer service was provided to the FIP properties, and wastes were diluted and discharged to this system.

Based on topographic surveys conducted by the Town of Farmington, as well as WESTON field observations, overland flow from the FIP properties travels via storm drains/drainage swales, intermittent/perennial streams, or directly to Scott Swamp Brook. Approximately 0.8 miles downstream of the FIP, Scott Swamp Brook joins the Pequabuck River, which is a fishery (Figure 4). Approximately 1.5 miles downstream of the FIP, the Pequabuck River enters the Shade Swamp Wildlife Management Area, which is an extensive alluvial swamp and habitat for a Federally-endangered species and a State species of special concern.

On July 12, 1995, WESTON collected 2 surface water and 21 sediment samples, including trip blank and equipment blank samples from the vicinity of the FIP to evaluate the surface water pathway. Sampling locations were selected based on the location of each property within the FIP, and to document, when possible, actual contamination from individual properties to the surface water pathway, including target fisheries and sensitive environments. Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses [53, pp. 39-40]. Table 16 summarizes sediment and surface water samples collected by WESTON on July 12, 1995 from the vicinity of the FIP to evaluate the surface water pathway and Figure 5 depicts WESTON sample locations [53, pp. 39-40].

Table 16

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: SEDIMENT				
SD-01	AHF02 MAGL19	0900	Grab (0 to 8 in.)	Sediment sample collected from the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge over the Pequabuck River.
SD-02	AHF03 MAGL20	0925	Grab (0 to 8 in.)	Sediment sample collected to document potential contamination entering the Pequabuck River via an unnamed stream near Pequabuck Crossing.
SD-03	AHF04 MAGL21	0915	Grab (0 to 6 in.)	Sediment sample collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River (MS/MSD).
SD-04	AHF05 MAGL22	0915	Grab (0 to 6 in.)	Duplicate of sample SD-03 collected for quality control.
SD-05	AHF06 MAGL23	1000	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-06	AHF07 MAGL24	1005	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-07	AHF08 MAGL25	1025	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the southern drainage swale.
SD-08	AHF09 MAGL26	1115	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the western drainage swale.
SD-09	AHF10 MAGL27	1137	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08.
SD-10	AHF11 MAGL28	1135	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the west branch of Scott Swamp Brook, due west of the northern edge of the EBM building.

Table 16

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (continued)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
SD-11	AHF12 MAGL29	1220	Grab (0 to 6 in.)	Sediment sample collected from wetlands along the west branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.
SD-12	AHF13 MAGL30	1300	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary, 20 feet south of sample SD-13.
SD-13	AHF14 MAGL31	1310	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary.
SD-14	AHF15 MAGL32	1420	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 50 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-15	AHF16 MAGL33	1430	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 75 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-16	AHF17 MAGL34	1432	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 8 Fable Lane.
SD-17	AHF18 MAGL35	1440	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 6 Fable Lane.
SD-18	AHF19 MAGL36	1241	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 125 feet east of the intersection of Spring Lane and Northwest Drive.
SD-19	AHF20 MAGL37	1251	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 175 feet east of the intersection of Spring Lane and Northwest Drive.

Table 16

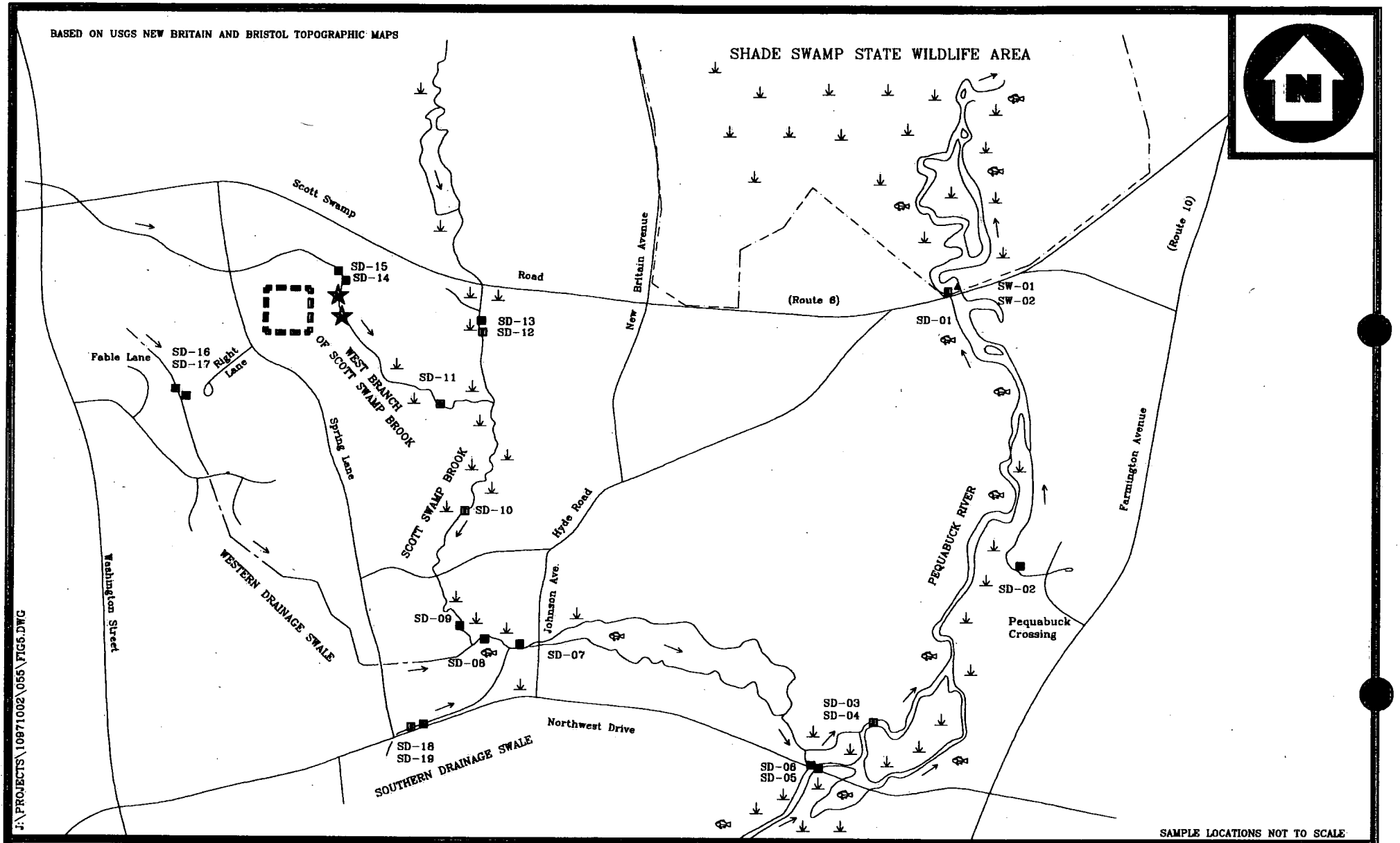
Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
SW-01	AHF30 MAGL47	0850	Grab	Surface water sample collected from the Pequabuck River in the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge.
SW-02	AHF31 MAGL48	0850	Grab	Duplicate of sample SW-01 collected for quality control.
TB-01	AHF34	0850	Grab	Trip blank sample collected for quality control.
RB-01	AHF32 MAGL50	0920	Grab	Rinsate blank sample collected for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

During the FIP WESTON environmental sampling event, eleven reference sediment samples were collected to determine background conditions for the area in the vicinity of the FIP. The reference sample locations were selected based on their upstream location from potential targets (Figure 5). Due to the variable concentrations of inorganic elements in natural sediments, reference samples were generally collected in pairs. In addition, WESTON collected eight target sediment samples to evaluate whether releases to surface water have occurred to Scott Swamp Brook or to the Pequabuck River; replicate and duplicate samples, a rinsate blank sample, and a trip blank sample were also collected to evaluate the surface water pathway in the vicinity of the FIP.

The following sediment samples were collected along the surface water pathway to evaluate observed releases and actual contamination targets which may be attributable to properties that are part of the FIP. Sample SD-01 was collected from the Shade Swamp Wildlife Area; SD-03/SD-04 were collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River; SD-07 was collected from the wetlands along Scott Swamp Brook downstream from its confluence with the FIP southern drainage swale; SD-08 was collected from the wetlands along Scott Swamp Brook downstream of its confluence with the western drainage swale; SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08; SD-10 was collected from wetlands along Scott Swamp Brook, downstream of its confluence with the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.



LEGEND

- STATE WILDLIFE AREA PROPERTY LINE
- WETLAND
- SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- PPE TO SURFACE WATER
- MANMADE STREAM/SWALE
- STREAM/RIVER
- FISHERY
- NEW ENGLAND AIRCRAFT PLANT #1

SURFACE WATER AND SEDIMENT SAMPLE LOCATION MAP

NEW ENGLAND AIRCRAFT
PLANT #1
FARMINGTON INDUSTRIAL
PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 5

Surface water samples, SW-01 and SW-02, were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. As previously stated, sediment sample SD-01 was also collected within Scott Swamp Brook, along with complete reference location samples documenting upstream concentrations. If sediment sample SD-01 reported observed release substances at the Shade Swamp Wildlife Area, the surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected. The following table summarizes sediment samples collected along the West Branch of Scott Swamp Brook, Scott Swamp Brook, and the Pequabuck River to evaluate observed releases and targets within these water bodies, and the corresponding reference samples used to establish reference concentrations upstream of the FIP.

Sediment Sample No.	Spacial Location	Reference Sample Numbers
SD-01	Shade Swamp Wildlife Area; Pequabuck River	SD-02, SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-03/4	Wetlands; Pequabuck River	SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-07	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-08	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17
SD-09	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-10	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-11	Wetlands; West Branch of Scott Swamp Brook	SD-14, SD-15

Table 17 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON sediment samples collected on July 12, 1995. A complete listing of analytical results is included in Attachment E. For each sample location, a compound or element was listed if it was detected at three times or greater than the appropriate reference sample concentration as described in the previous paragraphs. However, if the compound or element was not detected in the reference sample, the reference SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 17

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-01 AHF02 MAGL19	**INORGANICS**					
	Chromium	159	mg/kg	42.6	mg/kg	3.7 × REF
SD-07 AHF08 MAGL25	**INORGANICS**					
	Selenium	0.84	mg/kg	0.81	U mg/kg	1.04 × SDL
SD-08 AHF09 MAGL26	**VOC**					
	2-Butanone	90	µg/kg	15	U µg/kg	6.0 × SQL
	Toluene	29	µg/kg	15	U µg/kg	1.93 × SQL
	PESTICIDE/PCB					
	4,4'-DDD	28	J µg/kg	4.9	UJ µg/kg	5.7 × SQL
	INORGANICS					
	Chromium	611	mg/kg	20.7	mg/kg	29.5 × REF
	Copper	93.4	J mg/kg	7.6	UJ mg/kg	12.3 × SDL
	Selenium	17.9	mg/kg	0.81	U mg/kg	22.1 × SDL
	Zinc	265	mg/kg	26.7	mg/kg	9.9 × REF
SD-09 AHF10 MAGL27	**SVOCS**					
	Di-n-butylphthalate	570	J µg/kg	490	U µg/kg	1.2 × SQL
	Bis(2-ethylhexyl)phthalate	860	J µg/kg	490	U µg/kg	1.8 × SQL
	PESTICIDE/PCB					
	4,4'-DDE	11	J µg/kg	4.9	UJ µg/kg	2.2 × SQL
	4,4'-DDD	43	J µg/kg	4.9	UJ µg/kg	8.8 × SQL
	INORGANICS					
	Arsenic	5.2	mg/kg	2.5	U mg/kg	2.1 × SDL
	Cadmium	1.6	mg/kg	0.32	U mg/kg	5.0 × SDL
	Chromium	195	mg/kg	20.7	mg/kg	9.4 × REF
	Copper	50.6	J mg/kg	7.6	UJ mg/kg	6.7 × SDL
	Lead	74.1	mg/kg	21.6	mg/kg	3.4 × REF
	Mercury	0.17	mg/kg	0.08	U mg/kg	2.1 × SDL

Table 17

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-09 (concluded)	Selenium	7.7	mg/kg	0.81	U mg/kg	9.5 × SDL
	Zinc	209	mg/kg	26.7	mg/kg	7.8 × REF
SD-11 AHF12 MAGL29	**VOCS**					
	TCE	17	µg/kg	12	µg/kg	1.4 × SQL
	PCE	65	µg/kg	12	µg/kg	5.4 × SQL

UJ = The compound was analyzed for; but was not detected. The SQL is an estimated quantity.

Four VOCs, 2-butanone, toluene, TCE and PCE, were detected between 1.4 and 6.0 times the SQL in sediment samples collected from wetlands along Scott Swamp Brook and the West Branch of Scott Swamp Brook. The detection of TCE and PCE in sediment sample SD-11 is consistent with past use of chlorinated solvents at the properties in the FIP and with substances detected in groundwater samples collected from public drinking water wells in the area. No other VOCs were detected in sediment samples collected by WESTON.

Two SVOCs, di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in sediment sample SD-09 at 1.2 and 1.8 times the SQL, respectively [41]. SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08. The concentrations associated with the SVOCs detected in sample SD-09 were estimated. WESTON has included the detected concentrations of these SVOCs to remain consistent with technical directives provided by EPA Region I. Two pesticides were also detected in WESTON sediment samples; however, based on operational records provided by the properties that WESTON is conducting SIP investigations and prior analytical results of samples collected from FIP properties under WESTON SIP investigations; these pesticides will not be considered attributable to the NEAP property for the purposes of this SIP. Further, pesticides are ubiquitous in the environment and are used for routine pest and foliage control [41; 53, pp. 14-15].

Eight inorganic elements were detected in WESTON sediment samples ranging between 1.04 times the SDL (selenium) and 29.5 times the reference concentration (chromium). Values associated with the inorganic element copper at sample locations SD-08 and SD-09 were estimated [50]. WESTON has included the detected concentrations of this inorganic element to remain consistent with technical directives provided by EPA Region I. No other substances were detected in WESTON sediment samples.

Surface water samples were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. Sediment samples were also collected with complete reference location samples, documenting upstream concentrations. If sediment sample SD-01 reported observed release substances at the Shade Swamp Wildlife Area, surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected. Surface water sample results were compared with the Ambient Water Quality Criteria (AWQC) and the Ambient Aquatic Life Advisory Concentration (AALAC) benchmarks [20; 41; 50; 58]. Table 18 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON surface water samples [20; 41; 50; 58].

Table 18

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration (µg/L)	Benchmark Concentration (µg/L)	Comments
SW-01 AHF30 MAGL47	**INORGANICS**			
	Aluminum	472 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,700 J	--	NA
	Iron	1,180 J	1,000	1.18 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	1,970 J	--	NA
	Manganese	134 J	--	NA
	Nickel	6.4 J	160	Below BM
	Potassium	3,330 J	--	NA
	Sodium	16,000 J	--	
SW-02 AHF31 MAGL48	**INORGANICS**			
	Aluminum	442 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,800 J	--	NA
	Iron	1,120 J	1,000	1.12 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	2,000 J	--	NA

Table 18

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration (µg/L)	Benchmark Concentration (µg/L)	Comments
SW-02 (concluded)	Manganese	133 J	--	NA
	Nickel	8.3 J	160	Below BM
	Potassium	3,260 J	--	NA
	Sodium	16,000 J	--	NA

-- = No AWQC/AALAC Benchmark is provided for this contaminant.
BM = AWQC and AALAC Benchmark used as the ecological-based standard.

There were no elevated levels of VOCs, SVOCs, pesticides, or PCBs detected in surface water samples collected by WESTON on July 12, 1995. However, both SW-01 and SW-02 revealed elevated concentrations of ten inorganic elements. Of the ten inorganic elements detected, only two, iron and lead, exceeded environmental benchmarks. None of the inorganic elements detected in surface water samples SW-01 and SW-02 were detected in sediment sample SD-01 [41; 50; 67]. The complete analytical results of the WESTON sampling are included in Attachment E.

SOIL EXPOSURE PATHWAY

There are no on-site residents at the NEAP property; however, 88 full-time workers are currently employed at the property. Properties to the north of the NEAP property are not susceptible to surficial migration from potential on-site contamination due to the up-hill sloping topography [3; 4; 53]. According to the Town of Farmington Assessor's Map Nos. 69 and 77 the nearest residence to the NEAP property is depicted as Lot No. 56, located approximately 750 feet south at 37 Wells Drive (Figure 2) [4]. An estimated 2,651 people live within one radial mile of the NEAP property [11]. No terrestrial sensitive environments are located on the NEAP property [3; 63; 64]. There are no schools or day care centers within 200 feet of identified source areas on the NEAP property [3; 4; 53].

On July 10, 1989, NUS/FIT conducted an on-site reconnaissance and environmental sampling at the NEAP property as part of the SSI [1]. NUS/FIT collected a total of eight soil samples to evaluate the NEAP property, including a background soil sample, a replicate and duplicate soil sample, and a trip blank (Figure 2) [1, Table 3]. The NUS/FIT on-site soil samples were collected from depths of less than two feet; therefore, these samples can be used to evaluate surficial soil conditions at the NEAP property. Samples were submitted through the EPA CLP for target compound list organics and target analyte list elements [1, p. 7]. Pesticide/PCB analyses were not performed.

No VOCs were detected at three times the reference sample concentration or equal to or greater than the SQL in on-site soil samples collected by NUS/FIT; however, nine SVOCs were detected ranging between 3.3 (phenanthrene) and 6.2 (indeno(1,2,3-cd)pyrene) times the reference sample concentration [1, Attachment D]. In addition, five inorganic elements were detected ranging between 3.6 (calcium) and 26.1 (nickel) times the reference sample concentration [1]. The complete analytical results of the 1989 NUS/FIT SSI sampling event are included in Attachment A. The 1989 NUS/FIT on-site environmental sampling event is further discussed in the Waste/Source Sampling and Surface Water Pathway Sections of this report.

From 1992 through 1994, HRP conducted four environmental investigations on the NEAP property which included soil sampling to evaluate on-site sources of contamination. In 1992, HRP collected several surficial soil samples from the NEAP property which were reportedly submitted to a State-certified laboratory for VOC analyses using EPA Methods 8010, 8015, and 8020; and metals analyses for barium, cadmium, chromium, lead, mercury, nickel, copper, zinc, cyanide, and sodium chloride. No known reference samples were collected as part of this sampling event.

Surficial composite soil samples collected by HRP on May 4, 1992 detected the following: copper (0.04 mg/L) and TPH (18,790 mg/L) from the air compressor blow-down area; nickel (0.21 mg/L) from the southeast drainage ditch; and zinc (0.17 mg/L) from the second drainage ditch area located on the northeast corner of the property. The exact depths at which these samples were collected are not known. No VOCs were detected in any of the soil samples submitted for analysis.

Based on prior analytical results, approximately 50,000 square feet of surficial soil contamination is suspected to be available to the soil exposure pathway for the purposes of this SIP. A more detailed discussion on HRP sampling activities at the NEAP property is presented in the Waste/Source Sampling, Groundwater Pathway, and Surface Water Pathway Sections of this report. The complete analytical results of the HRP sampling events are included in Attachment B. All other known soil samples collected at the NEAP property were reportedly collected from known depths greater than two feet; therefore, these samples were not used to evaluate surficial soil contamination at the NEAP property.

AIR PATHWAY

The nearest individuals to the NEAP property are 88 full-time workers employed by NEAP [3, p. 1]. According to the Town of Farmington Assessor's Map Nos. 69 and 77, the nearest residence to the NEAP property is depicted as Lot No. 56, located approximately 750 feet south at 37 Wells Drive (Figure 1) [4; 53]. The nearest school is the Wheeler Elementary School, which has an enrollment of an estimated 376 students. The Wheeler Elementary School is located greater than one mile south of the NEAP property. An estimated 88,793 people live within a four-mile radius of the NEAP property, including on-site workers [11]. No known sensitive environments are located on the property. Table 19 summarizes the residential population located within four radial miles of the NEAP property [3; 1].

Table 19

Estimated Population within Four Radial Miles of New England Aircraft Plant #1

Radial Distance from NEAP (miles)	Estimated Population
On-site workers	88
0.00 < 0.25	164
0.25 < 0.50	498
0.50 < 1.00	1,989
1.00 < 2.00	16,108
2.00 < 3.00	29,899
3.00 < 4.00	40,047
TOTAL	**88,793**

The approximate total wetland area within four radial miles of the property is 2,000 acres [52]. In addition, several sensitive environments are located within four radial miles of the NEAP property, including one state-listed endangered species and two state listed threatened species. Table 20 summarizes the sensitive environments located within four miles of the NEAP property [20; 42; 52; 63; 64; 68; 69]. Sensitive environments listed on Table 20 which are available to the surface water pathway have also been discussed in that section of this report.

Table 20

Sensitive Environments within Four Radial Miles of New England Aircraft Plant #1

Radial Distance from NEAP (miles)	Sensitive Environment/Species (status)
0.00 < 0.25	West Branch of Scott Swamp Brook (Clean Water Act)
	0 acres of wetlands
0.25 < 0.50	0.5 acres of wetlands
0.50 < 1.00	20 acres of wetlands
	Hydrastis canadensis (State Endangered)
	Dicentra canadensis (State Threatened)
1.00 < 2.00	1,290 acres of wetlands
	Vitis novae-angliae (State Special Concern)
	Lygodium palmatum (State Special Concern)
	Alluvial Swamp (Unique Biotic Community)

Table 20

Sensitive Environments within Four Miles of New England Aircraft Plant #1 (concluded)

Radial Distance from NEAP (miles)	Sensitive Environment/Species (status)
2.00 < 3.00	320 acres of wetlands
	Apectrum hyemale (State Special Concern)
	Hydrophyllum virginianum (State Special Concern)
	Dicentra canadensis (State Threatened)
	Dryopteris goldiana (State Threatened)
3.00 < 4.00	370 acres of wetlands
	Hydrastis canadensis (State Endangered)
	Dicentra canadensis (State Threatened)
	Platanthera Dilatata (State Special Concern)

No known prior air sampling has been performed at the NEAP property. However, WESTON conducted air monitoring on June 29, 1995, during the SIP on-site reconnaissance, utilizing a photoionization detector; no readings above background were detected by WESTON [3, p. 4].

SUMMARY

The New England Aircraft Plant #1 (NEAP) property is part of the Farmington Industrial Park (FIP) and is located at 36 Spring Lane in Farmington, Hartford County, Connecticut at geographic coordinates 41° 42′ 10.2″ north latitude and 72° 52′ 19.5″ west longitude. According to the Farmington Town Assessor, the NEAP property is depicted on Map Nos. 69 and 77, as Lot No. 12B. The property was leased by New England Aircraft Plant #1 from 1961 to 1976 and is currently owned and operated by Inco Engineered Products, Inc. (IEP) of Ivoryton, Connecticut. The property houses an active manufacturing plant currently producing jet aircraft engine blades and vanes. The NEAP property is approximately eight acres and is occupied by a single story 84,000-square foot (sq ft) manufacturing building. The surrounding area is zoned for industrial and residential use. The NEAP property is abutted to the north by the Hamilton Standard Company, to the east by the West Branch of Scott Swamp Brook, to the south by the Connecticut Spring and Stamping Corporation, and to the west by Spring Lane. Edmunds Manufacturing Company and Mallory Industries, Inc. are located south and southwest of the property on Lots 23 and 22, respectively.

Processes at NEAP have remained relatively unchanged since 1961; however, chemicals used and wastes generated at the property may have varied throughout NEAP operational history due to industry technological advances. Processes currently used by NEAP include general machining; electro-chemical machining (ECM), which produces a metal hydroxide sludge; degreasing; and

non-destructive testing using a Zyglo fluorescent penetrant inspection process. Zyglo contains 10 percent white mineral oil and 15 percent kerosene. Wastes currently generated on-site include cutting oils; waste acetone; sodium chloride electrolyte solution, with metal hydroxide sludge; anti-rust compounds; Zyglo solution rinsewater; and waste petroleum naphtha. The cutting oils are either recycled back into the machines or manifested off-site for disposal. The sodium chloride electrolyte solution is usually recycled after the metal hydroxide sludge has been removed, however, the sodium chloride electrolyte solution has been manifested off-site for disposal. The metal hydroxide sludge is manifested off-site. The anti-rust compounds and Zyglo solution rinsewaters are discharged to the Town of Farmington sanitary sewer system.

From 1961 to 1978, anti-rust compounds were discharged to the West Branch of Scott Swamp Brook along with rinsewater from the Zyglo penetrant inspection process. On January 7, 1977, the Connecticut Department of Environmental Protection Water Compliance Unit (CT DEP/WCU) issued Order No. 2208 to NEAP, which required them to discontinue releasing wastewater to the West Branch of Scott Swamp Brook. NEAP complied with this order on May 10, 1978. According to an NEAP representative, after May 10, 1978, these wastes were discharged to the two on-site septic systems. The septic systems were reportedly used for on-site sanitary waste and permitted industrial wastewater disposal. Both septic tanks were reportedly removed in late 1978, when the company was connected to the town sewer system; however, both leachfields were left intact. According to the Town of Farmington Building Department, the 36 Spring Lane property was not connected to the town sewer until May 6, 1981. It is assumed that the facility began discharging the anti-rust compound and the Zyglo rinsewaters to the town sewer system when the facility was connected, either in 1978 or in 1981.

Chloroethane was reportedly used on-site for parts cleaning from 1961 to 1991, and 1,1,1-trichloroethane (1,1,1-TCA) was used for the same purpose from 1961 to approximately 1990. According to an NEAP representative, spent chloroethane and 1,1,1-TCA were manifested off-site and were not known to have been previously spilled or released at the property. Currently, parts cleaning is conducted on-site with mineral spirits and aqueous-based cleaners.

A CT DEP investigation was initiated in 1980, when an anonymous caller stated that sludge was being dumped on the parking lot on the east side of the manufacturing building. CT DEP observed three NEAP employees dump ten cubic yards of dewatered sludge out of 55-gallon drums onto the east parking lot. An NEAP employee explained that this was a routine temporary disposal method on days when their waste hauler was scheduled to pick up the sludge. After being dumped on the parking lot, the sludge would be loaded into the waste hauler's truck using a front-end loader. CT DEP issued an order to NEAP stating that the current sludge disposal method was unacceptable and that the sludge must be stored in a concrete bin for temporary containment. NEAP subsequently complied with the order by constructing a concrete roll-off box.

According to the NUS Corporation Field Investigation Team (NUS/FIT) Screening Site Inspection (SSI), CT DEP collected samples in 1984 of the metal hydroxide sludge which was stored in the roll-off box. The samples were submitted to an analytical laboratory for Extraction Procedure (EP) Toxicity metals analysis. Several inorganic elements were detected.

On May 12, 1988, NEAP contracted National Oil to remove and dispose of accumulated waste oil which was stored on-site. During the removal, the National Oil driver noticed a strong solvent odor apparently emanating from the waste oil. The driver collected an unspecified number of samples of the waste oil for chemical analysis. National Oil subsequently informed NEAP that analytical data indicated that the waste oil contained chlorinated solvents, including tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-TCA. However, an NEAP representative, Mr. David Derynoski, claimed that PCE and TCE had not been used or stored on-site and that the presence of PCE and TCE in the waste oil was due to illegal dumping from an off-site source. The NUS/FIT SSI indicated that 1,1,1-TCA was detected in the waste oil, and that this substance has been used and stored on-site from 1961 to 1990.

In September 1988, NUS/FIT completed a Preliminary Assessment Report (PA) of the NEAP property. The PA indicated that NEAP dumped metal hydroxide sludge, on a routine basis, in the parking lot east of the manufacturing building. NUS/FIT also reported that the facility was cited by the CT DEP for improper storage of the sludge, which contained barium, chromium, copper, nickel, and zinc. NUS/FIT concluded that the metal contaminants detected in the on-site sludge could potentially contaminate groundwater and surface water. As a result, the PA recommended that the NEAP property be further evaluated to assess the potential threat to public health and the environment. NUS/FIT did not collect any samples on the NEAP property as part of the PA investigation.

In July 1990, NUS/FIT completed an SSI of the NEAP property. Following an on-site reconnaissance, NUS/FIT collected eight soil and two sediment samples from the NEAP property on July 10, 1989. The samples were collected to characterize on-site sources and to evaluate the possibility of releases to the environment from these sources. Samples were submitted through the Environmental Protection Agency Contract Laboratory Program (EPA CLP) for target compound list organics and target analyte list elements. Nine semivolatile organic compounds (SVOCs) and five inorganic elements were detected in soil and sediment samples collected by NUS/FIT.

From 1991 to 1994, HRP conducted four environmental investigations at the NEAP property to evaluate on-site sources of contamination. During this period, numerous groundwater samples, soil samples, and surface water samples (from the West Branch of Scott Swamp Brook) were collected.

On June 29, 1995, Roy F. Weston, Inc. (WESTON) conducted an on-site reconnaissance at the NEAP property and reviewed records of hazardous waste generation and shipping manifests. According to available file information, hazardous wastes currently generated at the property include; 1,1,1-TCA, metal hydroxide sludge, waste cutting oil, acetone, sodium chloride, and naphtha. On July 12, 1995, WESTON collected 11 groundwater, 21 sediment and 2 surface water samples at locations up-gradient and down-gradient of the NEAP property. WESTON samples were submitted through the EPA CLP for volatile organic compound (VOC), SVOC, pesticide/polychlorinated biphenyl (PCB), total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Regional Laboratory.

According to state file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that Johnson Avenue Well No. 6 was first sampled in June 1982.

Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 parts per billion (ppb). The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-TCA at 1,000 ppb, chloroform at 680 ppb, PCE at 640 ppb, and TCE at 430 ppb. The highest concentrations of 1,1,1-TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

- Chloroform - Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue wells. Based on operational records provided by NEAP and prior analytical data from on-site samples collected by CT DEP, National Oil, NUS/FIT, and HRP; chloroform is not considered attributable to the NEAP property for the purposes of this Site Inspection Prioritization (SIP).

- 1,1,1-Trichloroethane - Based on operational records provided by NEAP and information from the NUS/FIT SSI; the detected concentrations of 1,1,1-TCA may be considered attributable to the NEAP property since this compound has been reportedly used during on-site operations at the manufacturing building between 1961 and 1990. 1,1,1-TCA was detected in a waste oil sample collected by National Oil in May 1988, and 1,1,1-TCA has been detected in on-site soil and groundwater samples. 1,1,1-TCA may degrade in soils and groundwater to 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), chloroethane, vinyl chloride, and acetic acid. The degradation of 1,1,1-TCA to cis-1,2-DCE and 1,1-DCE may explain the presence of the concentrations of these substances in several FIP drinking water wells which were sampled.

- Trichloroethylene - The concentrations of TCE in the FIP and Johnson Avenue Wells have consistently displayed steady declines over time. Concentrations which were significantly above the maximum contaminant level (MCL), have diminished to below the MCL, with the exception of Johnson Avenue Well No. 6, which still exceeds the MCL greater than two times. For the purpose of this SIP, the detected concentrations of TCE may be considered attributable to the NEAP property, since this substance has been detected in a waste oil sample collected by National Oil in May 1988. In addition, TCE has been detected in on-site groundwater monitoring wells. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride.

- Tetrachloroethylene - In general, PCE concentrations have steadily declined over the years in the FIP and Johnson Avenue Wells; however, two of the drinking water wells, FIP Well No. 2 and Johnson Avenue Well No. 3, still contain concentrations of PCE above the MCL. For the purpose of this SIP, the detected concentrations of PCE may be considered attributable to the NEAP property, since this substance has been detected in a waste oil

sample collected by National Oil in May 1988. PCE has also been detected in an HRP sediment sample, at a concentration of 14 ppb. The sample was collected from the West Branch of Scott Swamp Brook, at the location where the drainage ditch on the southeast corner of the property enters the brook. In addition, PCE has been detected by HRP in on-site monitoring wells located in the vicinity of the metal hydroxide disposal area. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride.

No known drinking water intakes are located within 15 downstream miles of the NEAP property. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered recreational fisheries, although neither water body is stocked. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the NEAP property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river. None of the fisheries downstream of the NEAP property have been closed.

The nearest individuals to the NEAP property are 88 full-time workers employed by NEAP. According to the Town of Farmington Assessor's Map Nos. 69 and 77, the nearest residence to the NEAP property is depicted as Lot No. 56, located approximately 750 feet south at 37 Wells Drive. The nearest school is the Wheeler Elementary School, which has an enrollment of an estimated 376 students. The Wheeler Elementary School is located greater than one mile south of the NEAP property. An estimated 88,793 people live within a four-mile radius of the NEAP property, including on-site workers. No known sensitive environments are located on the property.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1

[1] NUS/FIT (NUS Corporation/Field Investigation Team). 1990. Final Screening Site Inspection report for New England Aircraft Plant #1, TDD No. F1-8901-41. July 6.

[2] Goujiamanis, Taso (WESTON). 1995. Project Note: Latitude/Longitude Calculations, New England Aircraft Plant #1, TDD No. 9502-10-CWX.

[3] WESTON (Roy F. Weston, Inc.). 1995. Field Logbook for New England Aircraft Plant #1, TDD No. 9502-10-CWX. June 29.

[4] Town of Farmington, Connecticut. 1979. Assessor's Map Nos. 69 and 77.

[5] HRP (HRP Associates, Inc.). 1992. Site Investigation, New England Aircraft Products Division, 36 Spring Lane, Farmington, Connecticut. June (Revised August 1992).

[6] Town of Farmington Commercial Property Card for property at 0036 Spring Lane, Farmington, Connecticut. Account No. I0940300. Printed April 27, 1995.

[7] HRP (HRP Associates, Inc.). 1992. Letter to Mr. Maurice Hamel of CT DEP, regarding New England Aircraft Products Division, 36 Spring Lane, Farmington, Connecticut. November 12.

[8] U.S. EPA (U.S. Environmental Protection Agency). 1995. Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, Region I. Printout dated July 7.

[9] U.S. EPA (U.S. Environmental Protection Agency). 1995. Resource Conservation and Recovery Information System (RCRIS) database, Region I. Printout dated July 7.

[10] Schmidl, Joseph (WESTON). 1994. Phone Conversation Record with Mr. Jeff Schultz (Northeast Regional Climactic Data Center, Islip, NY), RE: Precipitation in Connecticut. TDD No. 9408-01-CWX. November 10.

[11] Frost Associates. 1995. CENTRACTS Database Printout of Population and Private Well Use Populations Within Four Mile Radius of New England Aircraft Plant #1, Farmington, Connecticut. April 18.

[12] USGS (United States Geological Survey). 1962. Surficial Geology of the New Britain, Connecticut Quadrangle.

[13] Rodgers, John (Connecticut Geological and Natural History Survey). 1985. Bedrock Geological Map of Connecticut.

[14] Ground Water, Inc. 1994. Hydrogeologic Effects of the Proposed Ground Water Diversion at the FIP Wellfield in Farmington, Connecticut. Reference No. 93378HR1. June.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1
(Continued)

[15] WESTON (Roy F. Weston, Inc.). 1995. Field Logbook for Mott Metallurgical Company, TDD No. 9409-08-CWS.

[16] Freeze & Cherry. 1979. Groundwater, by R. Allan Freeze and John A. Cherry. Prentice-Hall, Inc.

[17] United States Department of Commerce. 1991. 1990 Census of Population and Housing, Summary of Population and Housing Characteristics, Connecticut. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, Report 1990 CPH-1-8. July.

[18] CT DEP (Connecticut Department of Environmental Protection). 1982. Atlas of the Public Water Supply Sources & Drainage Basins of Connecticut, DEP Bulletin No. 4. June.

[19] Connecticut Department of Health. 1994. Connecticut Department of Health Services - Water Supplies Section, Community Supplies. Printout dated August 26.

[20] U.S. EPA (U.S. Environmental Protection Agency). 1990. Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51583. December 14.

[21] Schmidl, Joseph (WESTON). 1995. Project Note, RE: Groundwater Use Calculations, Dell Manufacturing Company, TDD No. 9409-01-CWS. May 5.

[22] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with Mr. John Wojtusik (Bristol Water Department), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. August 25.

[23] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with Art Mercuri (Unionville Water Company), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. August 29.

[24] Averill Environmental Laboratory, Inc. 1994-95. Collected Reports on Laboratory Examinations, Unionville Water Company, Samples collected between January 21, 1994 and January 26, 1995.

[25] Henry Souther Labs, Inc. 1995. Report on Laboratory Examinations, Plainville Water Company, Samples collected January 17, 1995. January 30.

[26] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with George Harris (Woodcrest Association, Inc.), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. September 6.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1
(Continued)

[27] Noto, Ellen (WESTON/ARCS), Phone Conversation Record with Mrs. Gladych (Farmington Line West Condominium Association), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. September 6.

[28] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with Mr. Carl Falcone (Metropolitan District Commission), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. August 10.

[29] Schmidl, Joseph (WESTON). 1995. Phone Conversation Record with Mr. Stephen Bieling (Plainville Water Company), RE: Water Supply Sources, TDD No. 9409-01-CWS. March 3.

[30] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with Donald Vaughan (Plainville Water Company), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. September 6.

[31] Schmidl, Joseph (WESTON). 1995. Phone Conversation Record with Mr. Art Mercuri (Unionville Water Company), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. January 6.

[32] Schmidl, Joseph (WESTON). 1995. Phone Conversation Record with Mr. Art Mercuri (Unionville Water Company), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. March 1.

[33] Unionville Water Company. 1993. The Unionville Water Company, Monthly Production (Gallons), January-December 1993. Undated.

[34] Noto, Ellen (WESTON/ARCS). 1994. Phone Conversation Record with Steve Aiudi (Cope Manor), RE: Background Information - Parsons, Robert E., Inc. Final Site Inspection, TDD No. 9104-18-AWS. September 6.

[35] USGS (U.S. Geological Survey). 1984. Collinsville Quadrangle, Connecticut. U.S. Geological Survey 7.5-minute Series (Topographic). 1956, photorevised 1984.

[36] USGS (U.S. Geological Survey). 1984. Avon Quadrangle, Connecticut. U.S. Geological Survey 7.5-minute Series (Topographic). 1957, photorevised 1984.

[37] USGS (U.S. Geological Survey). 1966. Bristol, Connecticut Quadrangle. 7.5-minute Series (Topographic). Photorevised 1984.

[38] USGS (U.S. Geological Survey). 1966. New Britain, Connecticut Quadrangle. 7.5-minute Series (Topographic). Photorevised 1992.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1
(Continued)

[39] Goujiamanis, Taso (WESTON). 1994. Phone Conversation Record with Mr. John A. McManus (New Britain Water Department), RE: Comerford Mfg. Company, Background Information. October 7. TDD No. 9304-08-AWS.

[40] Coomas, Michael (WESTON). 1995. Project Note RE: Service Population for FIP System, based on Customer List provided by Unionville Water Company. May 5. TDD No. 9409-08-CWX.

[41] Quigley, D. (WESTON). 1995. Letter to Ms. Christine Clark, RE: Data Validation Package under Case No. 23766 for Routine Analytical Service organic analyses of sediment and water samples collected by WESTON at New England Aircraft Plant #1/Farmington Industrial Park. October 5. TDD No. 9409-01-CWX.

[42] USGS (U.S. Geological Survey). 1993. Water Resources Data, Connecticut, Water Year 1992, by Cervione, Jr, M.A., Davies 3rd, B.S., and Hunter, B.W. USGS Water-data Report CT-92-1. March.

[43] USGS (U.S. Geological Survey). 1986. National Wetlands Inventory Map, Collinsville Quadrangle, Connecticut.

[44] USGS (U.S. Geological Survey). 1986. National Wetlands Inventory Map, Avon Quadrangle, Connecticut.

[45] USGS (U.S. Geological Survey). 1988. National Wetlands Inventory Map, Bristol, Connecticut Quadrangle.

[46] USGS (U.S. Geological Survey). 1966. National Wetlands Inventory Map, New Britain, Connecticut Quadrangle.

[47] Schmidl, Joseph (WESTON). 1995. Phone Conversation Record with Mr. Bruce Davies (U.S. Geological Survey, Water Resources), RE: Flow Rate on Scott Swamp Brook. TDD No. 9409-01-CWS. February 7.

[48] USDA (U.S. Department of Agriculture). 1960. Soil Survey of Hartford County, Connecticut, Soil Conservation Service.

[49] U.S. EPA (U.S. Environmental Protection Agency). 1994. Superfund Chemical Data Matrix (21), EPA Document Number EPA 540-R-94-009. June 24.

[50] Quigley, D. (WESTON). 1995. Letter to Ms. Christine Clark, RE: Data Validation Package under Case No. 23766 for Routine Analytical Service inorganic analyses of water and sediment samples collected by WESTON at New England Aircraft Plant #1/Farmington Industrial Park. September 29. TDD No. 9409-01-CWX.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1
(Continued)

[51] U.S. EPA (U.S. Environmental Protection Agency). 1995. Letter to Ms. Sharon Hayes, RE: Farmington Industrial Park, Farmington, Connecticut - Volatile Organic Analysis by GC/MS; Project Number 95308 for Analytical Procedure: EPA Method 524.2, Methods for the Determination of Organic Compounds in Drinking Water - Supplemental II, EPA/600/R-92/129, August 31, 1992. TDD No. 9409-01-CWX.

[52] Gamache, Michelle (WESTON). 1995. Project Note: Wetland Calculations. November 15. TDD No. 9409-01-CWX.

[53] WESTON (Roy F. Weston, Inc.). 1995. Field logbook for Dell Manufacturing Company, Inc., TDD No. 9408-10-CWX.

[54] Schmidl, Joseph (WESTON). 1995. Project Note RE: Hazardous Waste Generation at New England Aircraft Plant #1. TDD No. 9502-10-CWX. February 10.

[55] WESTON (Roy F. Weston, Inc.). 1995. Field Photograph Documentation for New England Aircraft Plant #1, TDD No. 9502-10-CWX.

[56] CT DEP (Connecticut Department of Environmental Protection). 1995. Uniform Hazardous Waste Manifest Reports for New Engalnd Aircraft Plant #1.

[57] Inco Engineered Products, Inc. 1995. Letter to Ms. M. Gamache, regarding MSDS for New England Aircraft Plant #1. TDD No. 9502-10-CWX. August 3.

[58] HRP Associates, Inc. (HRP). 1993. Additional Site Investigation, New England Airfoil Plant #1, 36 Spring Lane, Farmington, Connecticut. September 30.

[59] Aero-Tech. 1994. Letter to Mr. Maurice Hamel of CT DEP, regarding response to an emergency incident report (tetrachloroethylene and trichloroethylene in waste oil) from Mr. David Derynoski. July 20.

[60] Gamache, Michelle (WESTON). 1995. Phone conversation record with Town of Farmington Building Department; RE: New England Aircraft Plant #1 connection to municipal sewer system. TDD No. 9502-10-CWS. August 16.

[61] Gamache, Michelle (WESTON). 1995. Phone conversation record with Mr. Robert Boswell (New England Aircraft Plant #1 Environmental Engineer); RE: Wastes currently/historically generated and/or disposed at 36 Spring Lane, New England Aircraft Plant #1 property. TDD No. 9502-10-CWS. August 11.

[62] NUS/FIT (NUS Corporation/Field Investigation Team). 1988. Preliminary Assessment of New England Aircraft Plant #1. TDD No. F1-8803-18. September 2.

REFERENCES
NEW ENGLAND AIRCRAFT PLANT #1
(Concluded)

[63] Kingsbury, Stacey (CT DEP Protection, Natural Resources Center, Environmental Analyst). 1995. Letter to Taso Goujiamanis (WESTON), RE: Farmington Industrial Park, Farmington. February 10.

[64] Kingsbury, Stacey (CT DEP, Natural Resources Center, Environmental Analyst). 1995. Letter to Taso Goujiamanis (WESTON), RE: Shade Swamp Wildlife Area, Farmington. March 1.

[65] Micromedex TOMES Plus System. 1974. Toxicology, Occupational, Medicine, and Environmental Series, by Micromedex, Inc.

[66] U.S. EPA (U.S. Environmental Protection Agency). 1996. Memorandum to Mr. Robert Merkl, RE: Draft Site Inspection Prioritization. March 12. TDD No. 9409-01-CWX.

[67] U.S. EPA (U.S. Environmental Protection Agency). 1995. Superfund Chemical Data Matrix (21), EPA Document Number EPA 540-R-94-009. September.

[68] Schmidl, Joseph (WESTON). 1995. Project Note RE: Surface Water Pathway Calculations. February 7. TDD No. 9409-01-CWX.

[69] Schmidl, Joseph (WESTON). 1994. Phone Conversation Record with Mr. Jim Moulton (Connecticut Department of Environmental Protection, Division of Inland Fisheries), RE: Fisheries in Connecticut. TDD No. 9104-17-AWS. August 19.

ATTACHMENT A

NEW ENGLAND AIRCRAFT PLANT #1
SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
NUS CORPORATRION FIELD INVESTIGATION TEAM

Samples collected July 10, 1988

ATTACHMENT B

NEW ENGLAND AIRCRAFT PLANT #1
GROUNDWATER, SURFACE WATER, SEDIMENT, AND SOIL
SAMPLE ANALYTICAL RESULTS
HRP ASSOCIATES, INC.

Samples collected 1992 to 1994

ATTACHMENT C

NEW ENGLAND AIRCRAFT PLANT #1
FIP AND JOHNSON AVENUE WELLS DRINKING WATER
SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected from 1975 to 1989

ATTACHMENT D

NEW ENGLAND AIRCRAFT PLANT #1
FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE
ANALYTICAL RESULTS
UNIONVILLE AND PLAINVILLE WATER COMPANIES

Samples collected January 21, 1994, and January 26, 1995

ATTACHMENT E

NEW ENGLAND AIRCRAFT PLANT #1
GROUNDWATER, SEDIMENT, AND SURFACE WATER
SAMPLE ANALYTICAL RESULTS
ROY F. WESTON, INC.

Samples collected July 12, 1995